

Safety Instructions & Operator's Manual for

SNAPPER®

1855 SERIES



GARDEN TRACTORS & MOWER ATTACHMENTS

MANUAL 1-3017

SNAPPER POWER EQUIPMENT

McDonough, GA • 30253

E/I

FUQUA
INDUSTRIES
Company



SAFETY PRECAUTIONS



Read this Manual carefully before operating machine. Give special attention to all safety suggestions. They are included for your protection.

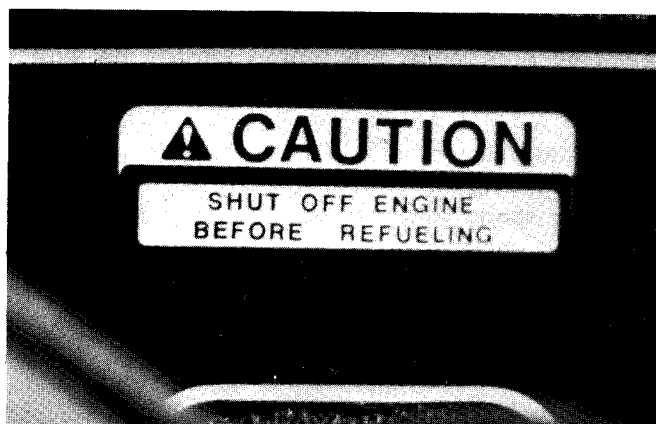
- Know the controls and how to stop quickly. **READ THE OPERATOR'S MANUAL.**
- Do not allow children to operate the vehicle. Do not allow adults to operate it without proper instruction.
- Do not carry passengers. Keep children and pets a safe distance away.
- Wear substantial shoes and long pants while using Mower.
- Clear work area of objects which might be picked up and thrown.
- Disengage power to mower blades, depress clutch-brake pedal and shift into neutral before attempting to start engine.
- Disengage power to mower blades, shut off engine and remove key before leaving operator's seat.
- Disengage power to mower blades and shut off engine before making any repairs or adjustments.
- Disengage power to mower blades when transporting or not in use.
- Take all possible precautions when leaving the vehicle unattended, such as disengaging power, lowering mower blades, shifting into neutral, setting parking brake, shutting off engine and removing key.
- Set mower at highest cutting height when mowing in rough ground or in tall weeds.
- Do not stop or start suddenly when going uphill or downhill.
- Reduce speed on slopes and in sharp turns to prevent tipping or loss of control. Exercise extreme caution when changing direction on slopes.
- Stay alert for holes in terrain and other hidden hazards.
- Do not operate mower in wet grass.
- Use care when pulling loads.
- Use only approved drawbar hitch point.
- Limit loads to those you can safely control.
- Do not turn sharply. Use care when backing.
- Watch out for traffic when crossing or near roadways.
- This Tractor is not designed, nor intended for street or highway use.
- When operating mower blades, never direct discharge of material toward bystanders nor allow anyone near vehicle while in operation.
- Handle gasoline with care — it is highly flammable.
- Use approved gasoline container.
- Never remove cap of fuel tank or add gasoline while engine is running or hot. Never fill fuel tank indoors. Wipe up spilled gasoline.
- Open doors if engine is run in garage — exhaust fumes are dangerous.
- Keep unit in good operating condition, and keep safety devices in place.
- Keep all nuts, bolts and screws tight to be sure equipment is in safe working condition.
- Never store equipment with gasoline in tank inside a building where fumes may reach an open flame or spark. Allow engine to cool before storing in any enclosure.
- To reduce fire hazard, keep engine free of grass, leaves or excessive grease.
- Mower should be stopped and inspected for damage after striking a foreign object, and damage should be repaired before restarting and operating.

- Do not change engine governor settings or over-speed engine.
- When using unit, proceed as follows:
- Mow only in daylight or in good artificial light.
- Never make a cutting height adjustment while engine is running.
- Shut engine off when unclogging mower.
- Check blade mounting bolts for proper tightness at frequent intervals.
- With riding mowers mow slopes up and down. Moving across slopes could tip a rider over.

**PERSONAL INJURY MAY RESULT IF
THESE PRECAUTIONS ARE NOT FOLLOWED.**



Look for this symbol to point out important safety precautions. It means — ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED.



INDEX

	PAGE		PAGE
INTRODUCTION	4	Governor Adjustment	21
IDENTIFICATION PLATES	5	Traction Drive Belt Adjustment	21
ASSEMBLY AND PRE-DELIVERY INSTRUCTIONS	7	Traction Drive Belt Replacement	21
CONTROLS	9	Rear PTO Belt Adjustment	22
Ammeter	9	Rear PTO Belt Replacement	22
Front and Mid PTO Switch	9	Implement and Mid PTO Belt Replacement	22
Choke	9	Forward/Reverse Pedal Adjustment	23
Ignition Switch	9	Transmission and Brake Test	23
Throttle	9	Transmission Adjustment	23
Hourmeter (Accessory)	9	Brake Adjustment	23
Speed Control/Parking Lever	9	Toe-In	24
Auxiliary Hydraulic Control Levers	9	Wiring	25
Rear Axle Shift Lever	10	Tractor Storage	25
Rear PTO Lever	10	Removing From Storage	25
Forward/Reverse Pedal	10	Trouble-Shooting	27
Neutral Return Brake Pedal	10		
Seat Control	10	TRACTOR SPECIFICATIONS	28
TRACTOR OPERATION	12		
Pre-Starting Inspection	12	ROTARY MOWER	29
Operating Tips	12	Installation	29
Starting Engine	13	Preparing Tractor	29
Driving Tractor	14	Preparing Mid Mount Mowers	30
Stopping Tractor	14	Attaching Mid Mount Mowers	30
Travel Speeds	14	Preparing 54" Rear Mount Mower	31
Moving By Hand	14	Attaching 54" Rear Mount Mower	31
Attaching Implements	14	Operation	32
LUBRICATION	15	Detaching	33
TRACTOR MAINTENANCE	18	Attaching and Detaching Using Mount Ramps	33
Battery	18	Mower Adjustments	34
Air Cleaner	18	Levelling — Mid Mount Mowers	34
Tires and Wheels	18	Levelling — Rear Mount	34
Fuel Filter	18	Mower Belt Tension	34
Cooling System	18	Belt Replacement	35
SERVICING	20	Replacing Blades	35
Spark Plug	20	Mower Storage	35
Breaker Points	20	Removing Mower From Storage	35
Engine Cylinder Head Bolts	20	MOWER SPECIFICATIONS	36
Carburetor Adjustment	20		
TRACTOR WARRANTY			

INTRODUCTION

The Snapper Model 1855A Garden Tractor is equipped with a 18 horsepower, air-cooled, four-cycle, two cylinder engine and is driven by a hydrostatic transmission in combination with a two speed rear axle.

Front and mid PTO driven implements are controlled by an electric clutch, which is driven by engine front PTO shaft. Mounted implements are raised and lowered by a hydraulic lift. Rear PTO is controlled by a belt idler clutch.

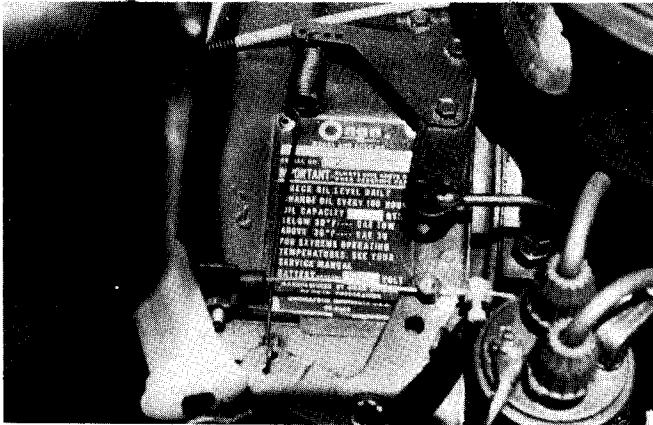
Tractor is equipped with headlights, twin tail lights and electric starter. A variety of front, mid and rear mounted implements are usable with the machine.

This Manual contains two sections regarding care of Tractor. "Maintenance" Section is concerned with usual servicing procedures, requiring average mechanical ability. "Servicing" Section discusses more complex procedures requiring above average mechanical ability and tools. Although all service must be performed in a competent manner, it is recommended that procedures discussed in "Servicing" Section be performed by able mechanics, such as those available at Snapper Dealers.

All directions, left or right, are when seated on Tractor seat. **READ THIS MANUAL CAREFULLY BEFORE OPERATING TRACTOR AND ROTARY MOWER.** Give special attention to paragraph entitled "Pre-Starting Inspection".

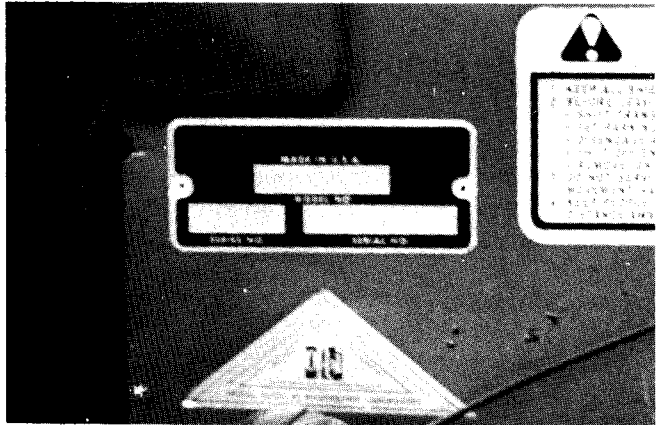
IDENTIFICATION PLATES

The Tractor chassis, engine and Mower base each have identification plates. Record numbers on these plates in spaces provided and refer to them when requesting parts. Note that engine has model, serial and specification numbers, while other plates have only model and serial numbers.



--

ENGINE SERIAL NO.



CHASSIS SERIAL NO.



MOWER SERIAL NO.

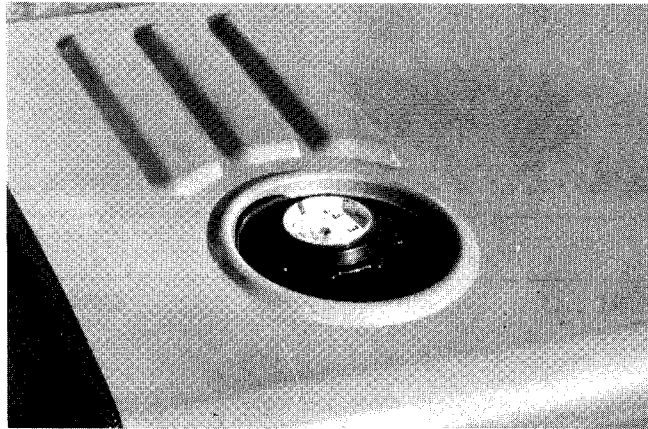
FUEL

Refill tank after using Tractor, except when storing machine. If a fuel tank is partially filled for an extended period of time, condensation may occur. Fill tank with clean, fresh, unleaded (preferred) or regular gasoline. **NEVER USE A MIXTURE OF GASOLINE AND MOTOR OIL.**

If dirt, water or other contaminants are present in fuel, drain fuel tank and line. Blow out line, clean tank and refill.



CAUTION: Fill fuel tank outdoors and never fill while engine is running or hot.



ASSEMBLY AND PRE-DELIVERY INSTRUCTIONS

These Instructions have been prepared as a guide to assist in pre-delivery and inspection, as outlined on New Tractor Pre-Delivery Inspection Check List (see back of Manual). Each item on the Check List is explained in these Instructions.

To ensure new tractor performance and complete customer satisfaction, carry out each inspection operation completely and accurately.

ASSEMBLY

STEERING WHEEL

The Garden Tractor is shipped completely assembled, except for steering wheel and operator's seat. With front wheel straight forward, position steering wheel on shaft, install washer and nut and tighten to 35-45 ft.-lbs. Insert center cover into groove in top of steering wheel with tang in recess in groove.

MOWER

See Page 29 for mower installation.

PRE-DELIVERY

ENGINE OIL LEVEL

Engine crankcase is filled at the factory to proper oil level. If oil level is low, fill to full mark on dipstick, Page 15. Also see page 12 for proper procedure for checking oil level.

ALL OIL DRAIN PLUGS

Check oil drain plugs for tightness.

FUEL LINE CONNECTIONS

Fill fuel tank and check for leaks at all connections.

SERVICE AIR FILTER

Check that air cleaner element is properly installed and retainer is tight.

ELECTRICAL CONNECTIONS

Check wiring connections for tightness.

CHOKE CONTROL

Be sure choke control operates freely and butterfly in carburetor is completely opening and closing.

ACTIVATE BATTERY



CAUTION: Electrolyte contains sulphuric acid. Keep acid out of eyes, off skin and clothes. "To prevent acid

burns use protective clothing and a face shield when handling electrolyte".

Tractor is shipped with a dry charge battery. Following procedure is recommended for activation of battery:

1. Remove battery from Tractor.
2. Remove caps and be sure vent holes are open.
3. Battery and electrolyte temperature should be at least 70° F.
4. Fill each cell with electrolyte to level of indicator, or 3/16 inch above top of separators.
5. Permit battery to stand for 30 minutes.
6. Check electrolyte level and add as necessary. **DO NOT OVERFILL.**
7. Replace filler caps and charge battery at a rate not exceeding 4 amps, until specific gravity of each cell reaches 1.250.
8. Install battery.

ALTERNATOR CHARGING RATE

Observe alternator charging rate by visual observation of ammeter.

ENGINE RPM (IDLE)

Engine idle speed should be 1800 to 2000 rpm. See Page 20.

ENGINE RPM (FULL THROTTLE)

Full throttle engine rpm should be 3500 to 3650 rpm, with no load. See Page 20.

CARBURETOR ADJUSTMENT

Carburetor is adjusted by engine manufacturer and should not be changed unless engine does not function satisfactorily.

Idling air adjustment should be made at same time as high speed adjustment is made, as each affects the other. See Page 21.

GOVERNOR PERFORMANCE

Governor action should be responsive without surging. Surging is the result of incorrect adjustment or binding of governor linkage.

TRANSMISSION OIL LEVEL

Check dipstick under seat, when oil is warm, to make certain transmission, differential and hydraulic system are properly filled with type "F" Automatic Transmission Fluid. For heavy duty or high temperature service, straight 20W or 30W motor oil with API classification SE, CC or CD is recommended.

LUBRICATE FITTINGS

Lubricate grease fittings with a good grade of lithium base, general purpose grease. See Page 16.

TRANSMISSION CONTROL AND BRAKE LINKAGE

Check adjustment. See Page 23.

TIGHTEN ALL CHASSIS BOLTS AND SCREWS

Check chassis bolts carefully. Some are in aluminum housings and if overtightened threads may be easily damaged.

WHEEL BOLTS (REAR)

Check rear wheel bolts for tightness. See Page 18.

TIRE PRESSURE

Tractors are shipped with tires inflated from 25 to 30 psi. Check tires carefully and bring pressures to amounts listed on Page 18.

ENGINE CYLINDER HEAD BOLTS

Check cylinder head bolts, in order shown, Fig. 28, to 168-192 in.-lbs. (14-16 ft.-lbs.) torque.

DRIVE TEST

Drive Tractor, observing ammeter, controls and clutch-brake operation. Check operation of all safety switches in brake, seat and PTO controls.

IS OPERATOR'S MANUAL AND ASSEMBLY INSTRUCTIONS WITH TRACTOR?

Make sure Operator's Manual and Assembly Instructions are with Tractor and explain following to owner:

- Controls
- Wheel Tread Adjustments
- Operating Procedures
- Lubrication
- Air Filter Service
- Tire and Battery Care
- Storage
- Operator's Manual
- Safety and Caution Notes and Procedures.

CONTROLS

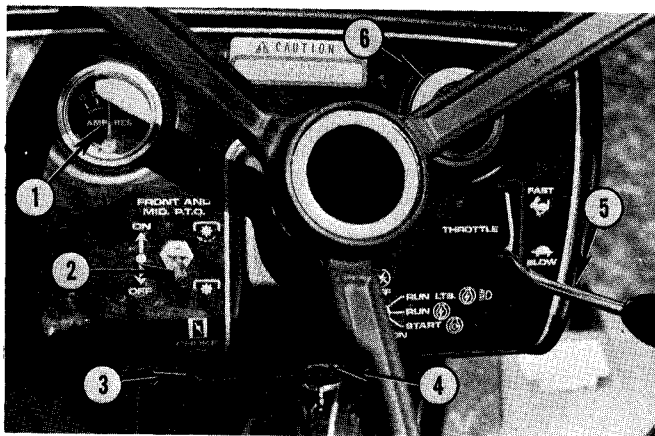


Fig. 1 — Instrument Panel

- | | |
|-----------------------------|--------------------------|
| 1. Ammeter | 4. Ignition Switch |
| 2. Front and Mid PTO Switch | 5. Throttle Lever |
| 3. Choke | 6. Hourmeter (Accessory) |

AMMETER — NO. 1, FIG. 1

Ammeter is on left side of instrument panel. Normally needle will be on right (+) side of dial when engine is running, indicating alternator's rate of charge. If ammeter indicates a discharge (with needle on (-) side of dial) for any length of time, check wiring, battery and circuit breaker for shorts or other malfunctions.

FRONT AND MID PTO SWITCH — NO. 2, FIG. 1

PTO switch is above choke control. Pull out and raise switch lever over safety cap to activate implement drive clutch and flipping down switch (disengaged) turns it off. Clutch is located on PTO shaft on front of engine, Fig. 26. Ignition switch must be turned on to activate PTO switch. PTO switch must be disengaged (down) to start engine. Verify that engine starter will not engage with PTO switch in engaged position.

CHOKE — NO. 3, FIG. 1

Pull knob out when starting a cold engine. As engine warms up and begins to run smoothly, push knob in.

IGNITION SWITCH — No. 4, FIG. 1

Ignition switch is key operated and is on right lower portion of instrument panel. It has four positions; off, run with lights, run and start. Turning key to start cranks starter motor. When key is re-

leased, it returns to run position. Turning key one notch to left of "Run" turns on lights. Turning key one more notch to left shuts off engine.

SEAT SWITCH (DEAD MAN CONTROL)

A switch in ignition cut off circuit is located under seat, Fig. 7. Operator must be seated on Tractor to start or run engine.

THROTTLE — NO. 5, FIG. 1

Pushing lever up increases engine speed. When lever is all the way down, engine is at idling speed.

HOURLMETER — NO. 6, FIG. 1 (ACCESSORY)

Hourmeter indicates accumulated hours of engine operation.

SPEED CONTROL/PARKING BRAKE LEVER — FIG. 2

This lever is used to select desired speed range and provide a memory for returning to the speed selected to meet varying conditions and also as a parking brake. Neutral return brake pedal (Fig. 5) must be completely depressed when changing the speed range or engaging the parking brake. *Never attempt to adjust the speed range selector without first depressing the neutral return pedal.*

AUXILIARY HYDRAULIC CONTROL LEVERS — NOS. 1 and 2, FIG. 3

Tractor will be equipped with either a 2-spool or 3-spool hydraulic control valve. Control lever, No. 2, operates 3-point hitch. Control lever, No. 1, controls operation of mid and front mounted implements. The

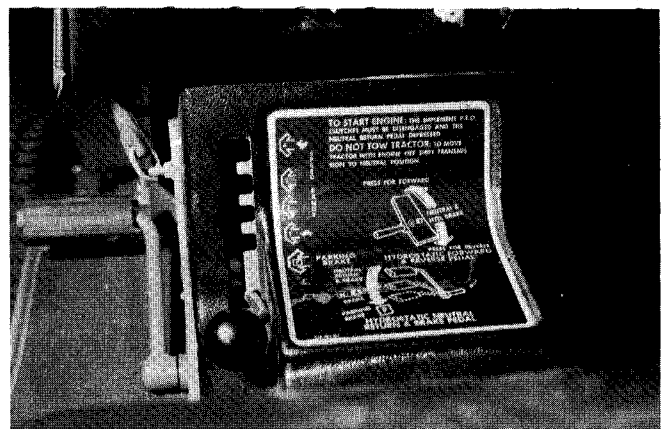


Fig. 2 — Speed Control/Parking Brake Lever

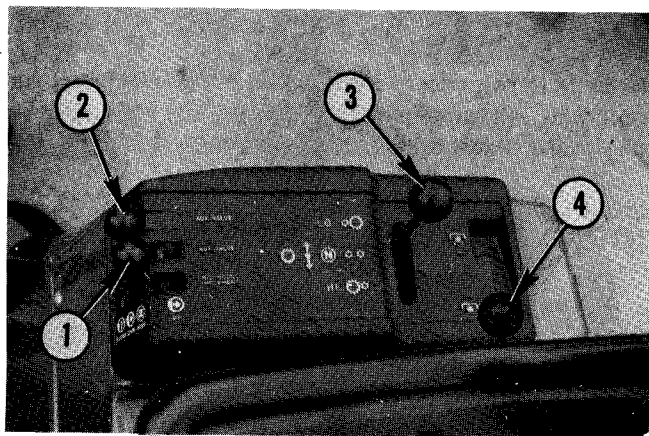


Fig. 3 — Control Console

1. Mid Mounted Implement Control Lever
2. 3-Point Hitch Control Lever
3. Rear Axle Shift Lever
4. Rear PTO Control Lever

No. 1 valve spool has four positions; lift, open center, lower and float. No. 2 and No. 3 valves have three positions; lift, open center and lower. Third control lever will control operation of remote hydraulic cylinders.

REAR AXLE SHIFT LEVER — NO. 3, FIG. 3

Moving lever to right places rear axle in "Low" range and to left in "High" range. Neutral return brake pedal, Fig. 5, should be depressed to disengage rear axle when engine is running.

REAR PTO CONTROL LEVER — NO. 4, FIG. 3 — (OPTIONAL)

Moving lever to right engages rear PTO and moving lever to left disengages PTO. Control lever must be in "Off" position to start engine. Verify that engine starter will not engage with rear PTO engaged.

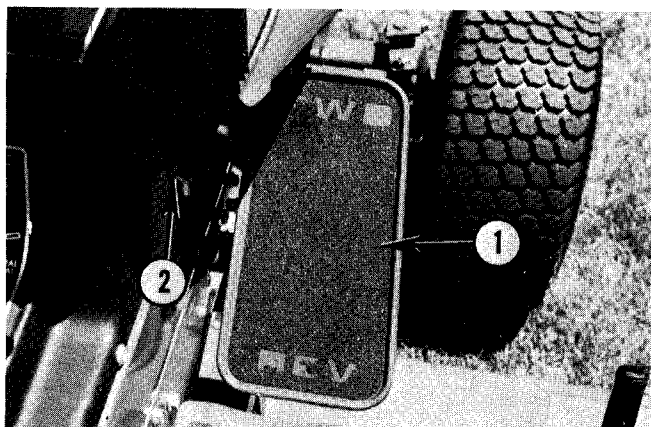


Fig. 4 — Forward/Reverse Pedal

1. Forward/Reverse Pedal
2. Hood Latch

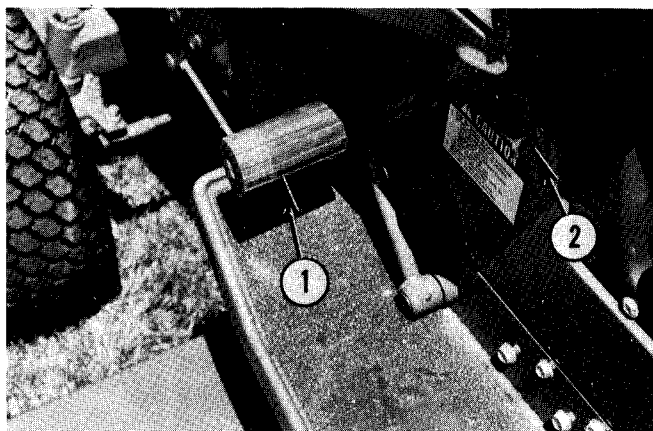


Fig. 5 — Neutral Return Brake Pedal

1. Neutral Return Brake Pedal
2. Hood Latch

FORWARD/REVERSE PEDAL — NO. 1, FIG. 4

This pedal controls direction of travel of Tractor. Pushing toe down, Tractor moves forward. Pushing heel down, Tractor moves rearward. Removing foot from pedal, Tractor will stop and remain stationary. When leaving Tractor, engage parking brake.

For constant operating speed with memory, the speed selector, Fig. 2, and throttle lever, Fig. 1, should be pre-set and the forward control pedal, Fig. 4, fully depressed.

NEUTRAL RETURN BRAKE PEDAL — NO. 1, FIG. 5

When pedal is all the way up brake is disengaged. Pushing pedal part way down positions forward/reverse pedal, No. 1, Fig. 4, in neutral. Pushing pedal all the way down engages brake. To lock parking brake, engage speed control parking brake lever to "Park" position while holding brake pedal firmly depressed, Fig. 6. Pedal must be depressed to start engine. Pedal must be "Up" to shift forward/reverse pedal from neutral.



CAUTION: Verify that engine starter will not engage without depressing neutral return pedal.

SEAT CONTROL — NO. 1, FIG. 7

Seat may be moved forward or backward to match operator size by pulling seat control rearward and sliding seat to desired position.

For extremely tall or short operators additional seat mounting holes are provided in fender pan that increase adjustment range.

Fore and aft seat position has a great effect on operator comfort as regards the heel and toe transmission control pedal. Operator can easily determine

[illegible]

1. Fore/Aft Seat Control
2. Safety Switch
3. Alternate Mounting Holes

TRACTOR OPERATION

Read these instructions carefully before operating Tractor! Become thoroughly familiar with all controls and their operating characteristics. **TAKE TIME TO BE SAFE!**

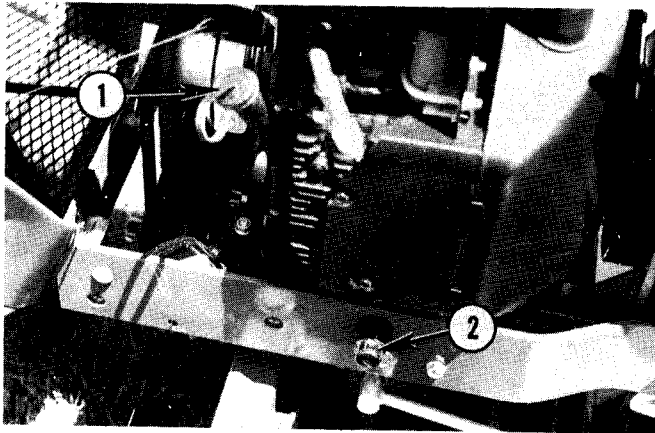


Fig. 8 — Engine Crankcase Lubrication

1. Dipstick and Fill Point 2. Drain Plug

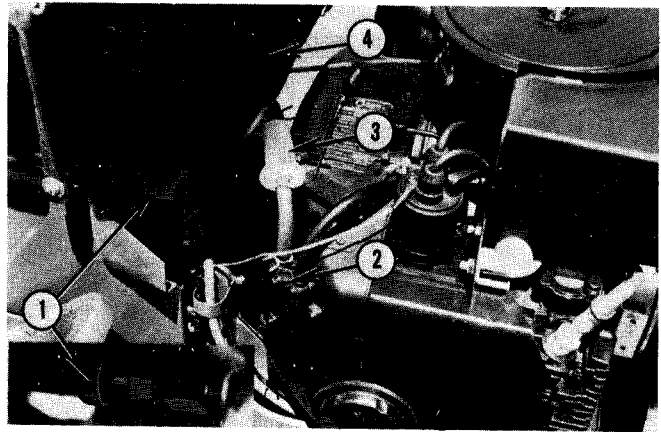


Fig. 9 — Fuel Shut-Off Location

1. Fuel Shut-Off Valve 3. Fuel In-Line Filter
2. Fuel Pump 4. Fuel Tank

PRE-STARTING INSPECTION

IMPORTANT: Carefully check Tractor, giving special attention to lubrication, before starting engine! An inadequately filled crankcase can quickly damage an engine.

Check following:

1. Remove dipstick, No. 1, Fig. 8, wipe carefully with clean cloth, then replace in filler hole, pushing it all the way in. Remove and check oil level. If not to full mark, fill to this point. **DO NOT OVER-FILL.** Use only lubricants recommended in "Lubrication" Section. With proper oil level, dipstick will indicate excessive oil level when dipstick is removed after stopping engine. Wipe off and reinsert dipstick and remove again to check. (Crankcase pressure forces oil up into dipstick tube. Removing dipstick allows oil to flow back into crankcase).

NOTE: After first 10 hours of operation with a new engine, drain, change element and refill crankcase as recommended. See Page 15.

2. Check oil level of transmission rear axle, filling if needed.

NOTE: After 10 hours of operation, remove and replace oil filter, Fig. 17 and Page 16, on bottom of transmission. Refill with oil as recommended in "Lubrication" Section, Page 15.

3. Fill fuel tank with clean, fresh, unleaded (preferred) or regular grade gasoline.



CAUTION: Never smoke when filling fuel tank. Never fill tank near sparks or flame. If fuel is spilled on Tractor, wipe up and allow time to evaporate before attempting to start engine.

4. If there are traces of dirt, water or other contaminants in fuel, as visible through transparent case containing in-line filter, No. 3, Fig. 9, close fuel shut-off valve, No. 1, and remove and replace in-line filter. Make certain valve is open at least two full turns before attempting to start engine.

OPERATING TIPS



CAUTION: Never operate Tractor nor any power driven attachments with shields or guards removed.

Operate Tractor at 3/4 to full throttle for first five hours. It should be under full load (such as with Rotary Mower in operation) during entire break-in period.

Always maintain sufficient engine speed to prevent lugging. Required engine speed will vary with implement or load.

Maintain safe operating speeds at all times in relation to ground conditions

When leaving Tractor seat, always turn off engine, make sure all controls are in "Neutral" or "Off" position, engage parking brake and remove key.

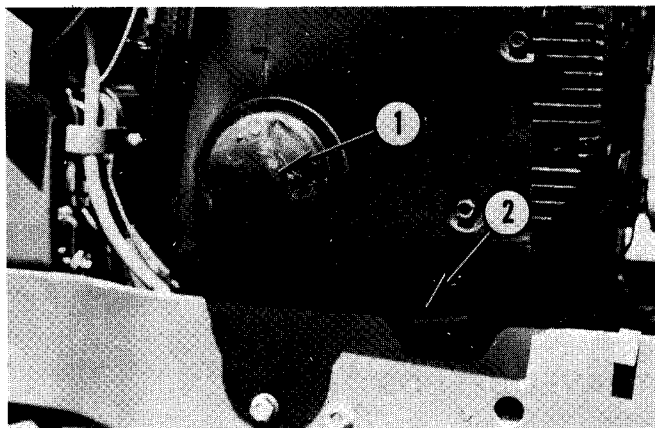


Fig. 10 — Starter Motor Location

1. Engine Crankcase Oil Filter 2. Starter Location

IMPORTANT: NEVER OPERATE TRACTOR WITH HYDRAULIC CONTROL VALVE REMOVED. TO DO SO WILL QUICKLY RESULT IN SEVERE DAMAGE TO TRANSMISSION!

STARTING ENGINE



CAUTION: Make sure all operating controls of Tractor and implement are in neutral or disengaged before attempting to start engine.

1. Depress neutral return brake pedal and disengage PTO switch and PTO lever. Pedal, switch, seat and PTO lever are equipped with safety switches. If pedal is not depressed and PTO controls are not disengaged, starter motor should not operate. If operator is not on seat, ignition will be grounded and engine will not start or run.

2. Advance throttle approximately 1/4 and pull choke all the way out.

NOTE: If engine is warm, it may not be necessary to use choke to start engine.

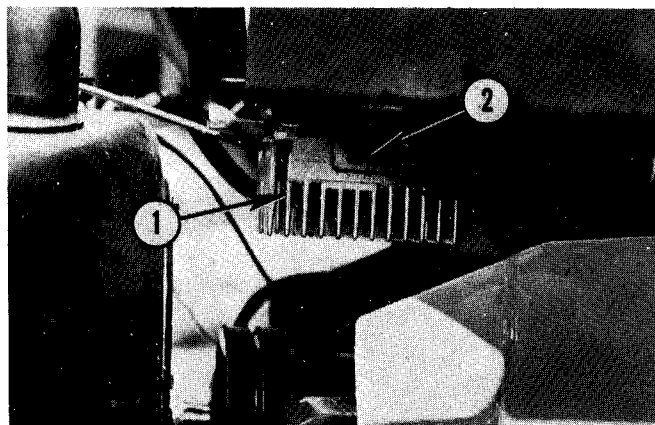


Fig. 11 — Rectifier-Regulator

1. Rectifier-Regulator 2. Connector

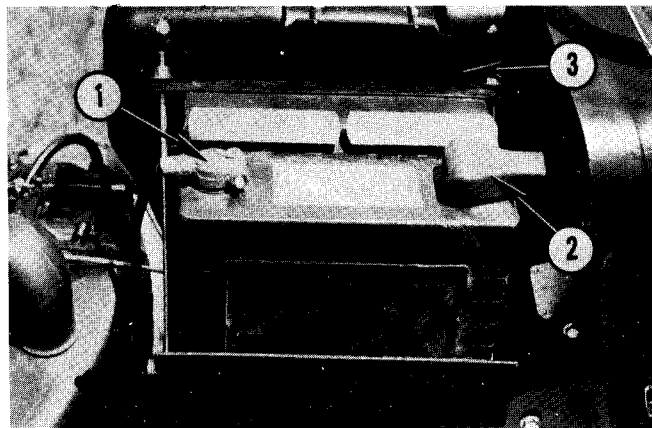


Fig. 12 — Battery

1. Negative Post (-)
2. Positive Post (+)
3. Fuel Tank

3. Turn ignition key to start position. Release key when engine starts. If lights are needed, turn key to lights position after engine starts.

4. If engine is cold, allow it to warm up briefly before engaging transmission or implement drive.

5. Adjust choke for smooth operation, pushing in to off position when engine is warm.

IMPORTANT: READ FOLLOWING INFORMATION CAREFULLY. IT PERTAINS TO PROPER OPERATION AND PROTECTION OF ELECTRICAL SYSTEM!

a. Never operate starter motor, Fig. 10, continuously for more than 30 seconds. Prolonged operation can damage starter motor. If engine does not start after a few seconds, release ignition key and allow a few moments for starter to cool before again attempting to start.

b. If battery loses its charge and requires jumping, make sure alternator is disconnected. To disconnect, pull connector, No. 2, Fig. 11, from rectifier-regulator, No. 1. Failure to do so can cause damage to alternator when battery is jumped. When using a booster battery, always connect cables positive (+) to positive, and negative (-) to negative, Fig. 12. Battery posts are marked. If battery requires charging, always remove from Tractor. Reconnect plug in rectifier-regulator after engine is started.



CAUTION: Gases which emanate from a battery are explosive. Never smoke nor allow flame or sparks near a battery that is being charged.

c. Never operate Tractor with battery removed, unless connector from rectifier-regulator is unplugged.

d. If welding, using Tractor frame as a ground, always unplug connector to rectifier-regulator.

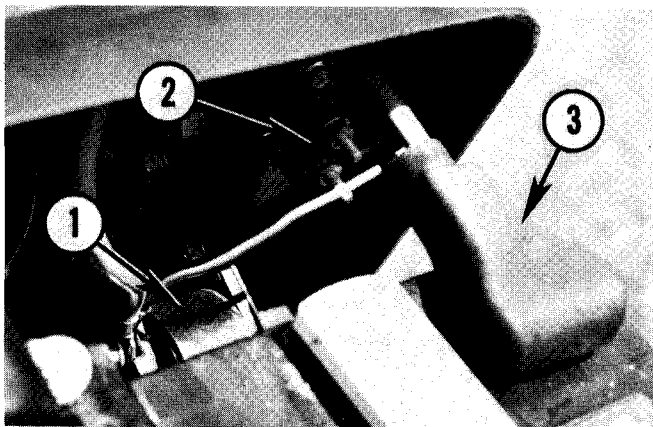


Fig. 13 — Circuit Breaker Location

1. Starter Solenoid
2. Circuit Breaker
3. Positive Post (+)

DRIVING TRACTOR



CAUTION: Carbon monoxide is odorless, tasteless and deadly. Never operate Tractor engine in a closed building.

1. With engine warm, depress neutral return brake pedal. Place rear axle shift lever in high or low range and speed control lever in desired speed range. Release neutral return brake pedal.

2. Advance throttle at least half way and slowly push forward/reverse pedal in desired direction of travel.



CAUTION: Move forward/reverse pedal slowly until familiar with Tractor's operating characteristics. When changing directions, pause momentarily in neutral. Do not use excessive force on forward/reverse pedal. Excessive force can damage transmission.

An additional adjustment to provide optimum comfort of extremely large or small operators has been provided. Refer to Page 23 for adjusting procedure.

STOPPING TRACTOR

NOTE: It is characteristic of a hydrostatic Transmission to act as a brake for Tractor. Periodically check parking brake for proper operation and adjust if necessary. See "Transmission Test" in "Servicing" Section.

1. Tractor may be stopped by depressing neutral return brake pedal or removing foot from forward/reverse pedal.

2. Push down on neutral return brake pedal and engage parking brake.

NOTE: If an emergency stop is required, quickly depress neutral return brake pedal.

3. If Tractor has been working hard, allow engine to operate at idle for a few moments. This will allow it to cool more quickly and evenly.

4. Turn key to off and remove from Tractor.



CAUTION: If mounted implements are attached to Tractor, always lower them to ground before leaving seat.

TRAVEL SPEEDS

Tractor has a two-speed rear axle and infinite speed range. Low speed range is 0 to 4.5 mph forward and 0 to 4 mph in reverse. High speed range is from 0 to 9 mph and 0 to 6.5 mph in reverse.

MOVING BY HAND

If it is necessary to move Tractor without engine power, place rear axle shift lever in neutral and speed control/parking brake lever into upper notch. Then move Tractor by hand.

IMPORTANT: Never push or tow Tractor with another vehicle, over 10 mph.

ATTACHING IMPLEMENTS

Tractor is equipped with a 3-point lift linkage (Category 0) for mounted implements (Accessory) and a heavy-duty drawbar for pull-behind implements, Fig. 14



CAUTION: Never attach pull-behind equipment at any point on Tractor other than drawbar.

For information regarding attachments other than Rotary Mower, refer to Operator's Manual for implement. For information regarding installation and operation of Rotary Mower, refer to Page 29.

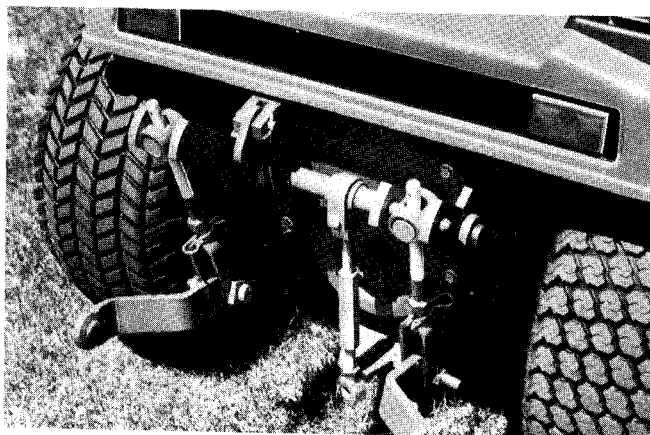


Fig. 14 — 3-Point Hitch and Drawbar

LUBRICATION

Proper lubrication is necessary to ensure trouble-free performance throughout life of Unit. Make it a habit to lubricate at recommended intervals. Use a good quality Multi-Purpose lithium base type grease. Always clean grease gun and fittings before and after greasing.

IMPORTANT: Never attempt to operate Unit unless it is properly lubricated.

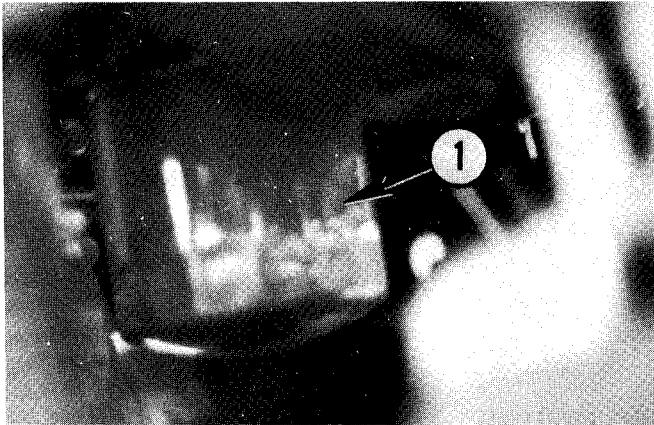


Fig. 15 — Transmission Filter

1. Filter (under left rear fender)

AFTER FIRST 10 HOURS OF OPERATION

Drain crankcase, change element and refill after first 10 hours of operation. Refer to 25 hours.

10 HOURS OR DAILY

TRANSMISSION FILTER — FIG. 15

After first 10 hours of operation remove oil filter, which is located under left rear fender just forward of tire. Partially fill new filter with M-1110 Automatic Transmission Fluid and install on transmission. Hand tighten only. Replace filter after each 100 hours of operation or annually.

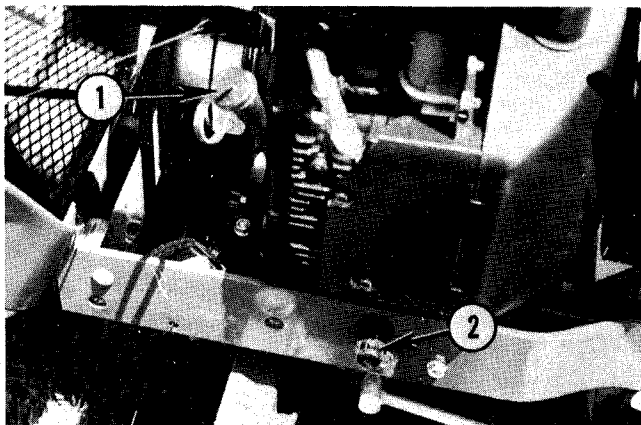


Fig. 16 — Engine Crankcase Lubrication

1. Dipstick and Fill Point 2. Drain Plug

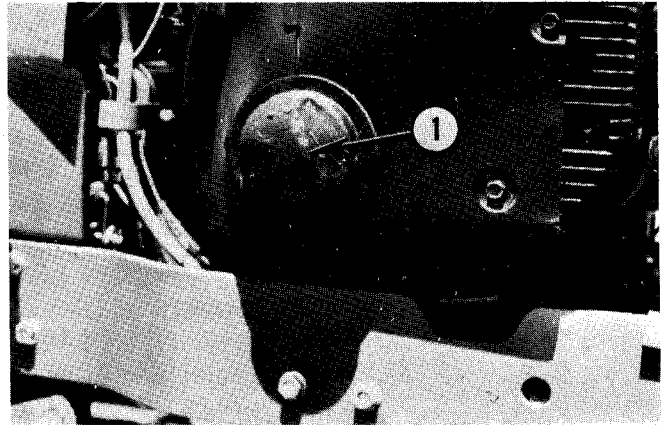


Fig. 17 — Engine Lubrication

1. Filter

CHECK CRANKCASE — FIG. 16

Remove dipstick and check oil level before starting engine at beginning of each day's operation. If oil is not to full mark, add to this point. Do not overfill. If overfilled, drain until oil is at full mark on dipstick. (After engine shut down, dipstick tube will be partially filled due to crankcase pressure. Remove dipstick, which breaks air lock, wipe off, reinsert then remove and check oil level.)

25 HOURS

CHANGE ENGINE CRANKCASE OIL AND FILTER

Drain crankcase with engine stopped and oil warm.

1. Remove crankcase drain plug, Fig. 16.
2. Unscrew and remove filter, Fig. 17.
3. Wipe filter mounting surface and apply a thin coat of clean oil to new filter gasket.
4. Tighten filter by hand until gasket contacts filter base and then tighten 1/2 turn more.
5. Replace drain plug and fill crankcase, Fig. 16, with SAE 30 oil, Service Class SE/CC (see Temperature Chart), Page 16.
6. Run engine until warm and check for leaks.
7. Check oil level on dipstick.

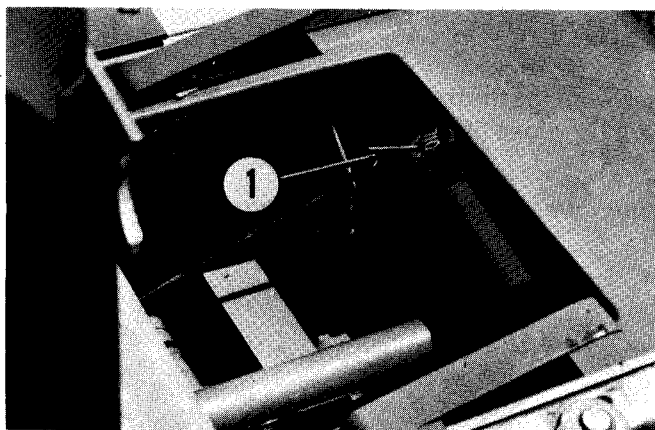


Fig. 18 — Transmission Lubrication

1. Dipstick and Fill Point

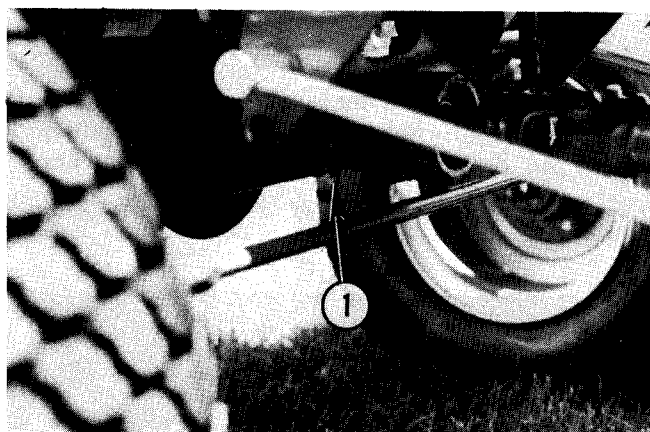


Fig. 20 — Front Axle Lubrication

1. Grease Fitting

TEMPERATURE CHART

Above 30° F.	SAE 30
30° to 0° F.	SAE 10W/30
Below 0° F.	SAE 5W/20

CHECK TRANSMISSION AND REAR AXLE — FIG. 18

NOTE: Do not check oil level when oil is cold. Operate Tractor until oil is warm (3-5 minutes) then check level.

Raise seat and check oil level on dipstick, No. 1, Fig. 18. If not to full mark, add oil as follows:

1. Fill through filler tube until oil reaches full mark on dipstick.
2. Start engine and operate implement lift lever, No. 2, Fig. 3, up and down four or five times to allow oil to fill hydraulic cylinder.
3. Drive Tractor forward and reverse through full range of transmission speed.
4. Stop Tractor, shut off engine, check oil level and add oil if needed.
5. Repeat Steps 2, 3 and 4 until oil reaches full mark on dipstick.

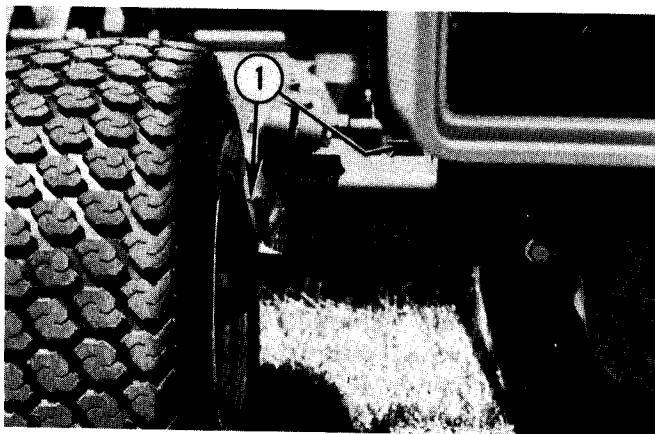


Fig. 19 — Front Axle Lubrication

1. Grease Fittings

50 HOURS

FRONT AXLE

Lubricate fittings, Figs. 19 and 20, with two shots of multi-purpose lithium base grease.

300 HOURS OR ANNUALLY

REPLACING TRANSMISSION AND REAR AXLE OIL

1. Operate Tractor until oil is warm, remove drain plug, No. 1, Fig. 21, and drain oil.
2. Clean plug and reinstall in transmission housing.
3. Refill system with new oil by following procedure on Page 16.

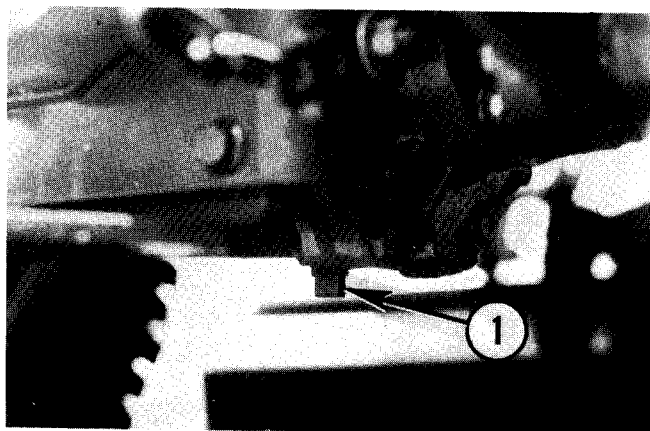


Fig. 21 — Transmission Lubrication

1. Drain Plug

REPACKING FRONT WHEEL BEARINGS



CAUTION: Block Tractor securely before removing a wheel.

1. Remove wheels from spindles and thoroughly clean bearings and seals in a suitable cleaning solvent (not gasoline). Inspect for wear. Replace bearings or seals if necessary. Remove old grease from inside hub.

2. Repack each bearing assembly with Lithium Base Bearing Grease. Fully pack seals between lips with grease.

3. Reinstall seal and inner bearing on spindle and apply sufficient amount of grease to fill space between inner bearing and seal.

4. Install wheels on spindles. Avoid damaging seals.

5. Rotate wheel and tighten hex nut to 15-20 ft.-lbs. torque.

6. Install retainer on nut so that castellations are aligned with cotter pin hole.

7. Back off nut and retainer one castellation and secure with cotter pin. If wheel does not rotate freely back off nut one more increment.

TRACTOR MAINTENANCE

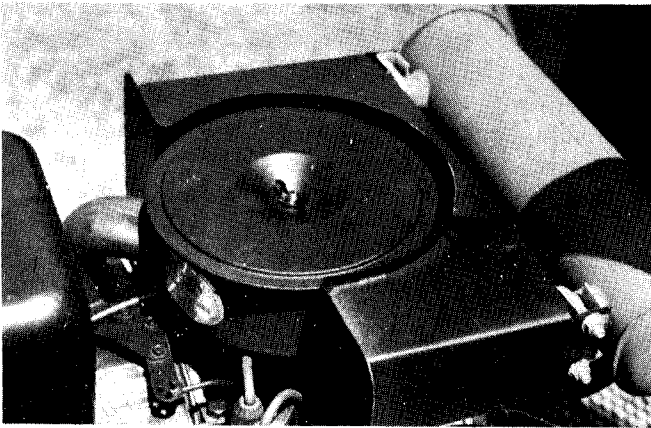


Fig. 22 — Air Cleaner

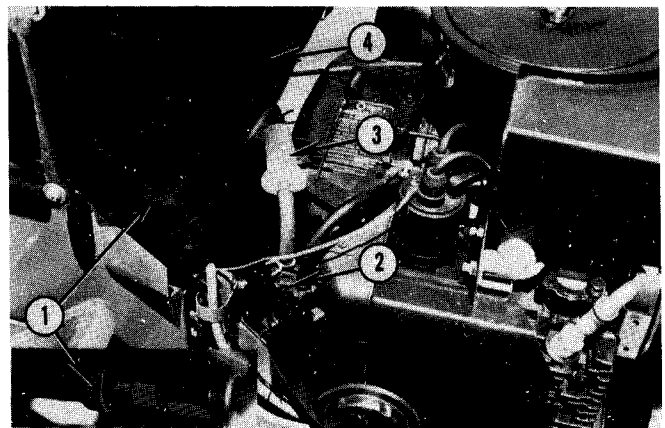


Fig. 23 — Draining Fuel Tank

1. Fuel Shut-Off Valve
2. Fuel Pump

3. Fuel In-Line Filter
4. Fuel Tank

BATTERY — FIG. 12

Check and maintain level of electrolyte every 20 hours of operation, or once each month. Fill slightly above plates with distilled water. Don't overfill. Keep battery posts and cable ends clean and lightly coated with petroleum jelly. Maintain boot on positive post.

AIR CLEANER — FIG. 22

IMPORTANT: If air cleaner becomes too dirty, engine will not receive sufficient air to run properly. Symptoms: Loss of power, flooding, hard to start and overheating.

This engine is equipped with a paper element and a polyurethane pre-cleaner that must be removed, cleaned and oiled every 25 hours of operation, or more under extremely dusty conditions.

1. To clean pre-cleaner wash in water and detergent. Remove excess water by squeezing like a sponge and allow to dry thoroughly. Distribute three tablespoons of SAE 30 engine oil evenly around pre-cleaner. Knead into and wring excess oil from pre-cleaner.

2. Depending on conditions in which Tractor is operating, inner paper element should be replaced whenever it becomes excessively dirty.

IMPORTANT: Never run engine with air cleaner removed. Dirt will enter engine and score cylinders.

TIRES AND WHEELS

Keep treads free of debris and tires inflated to correct pressures. Tires which are overinflated or

underinflated will wear more rapidly. Proper pressures for various tire sizes are as follows:

FRONT

18 x 8.50 — 8 8-10 psi

REAR

26 x 12.00 — 12 6-8 psi

Periodically check front wheel bolts for 30 ft.-lbs. torque. Rear wheel hub bolts (10) should be tightened to 50-60 ft.-lbs. torque. Rear wheel lug nuts (2) should be tightened to 40 ft.-lbs. torque.

FUEL FILTER — FIG. 23

Fuel filter is an in-line filter. If excessively dirty, as viewed through transparent case, shut off fuel valve, remove and replace filter.

Inspect fuel tank at start of each operating season. If water or dirt is present, clean tank and fuel line.

COOLING SYSTEM

Inspect engine cooling fins frequently and remove any accumulation of debris.

Inspect rotary screen, Fig. 24, daily for debris plugging screen. To clean, wipe chaff off of rotary screen to engine.

NOTE: If air pressure is available, blowing air in reverse direction into fins will dislodge grass or dirt accumulations.

IMPORTANT: A dirty screen or fins can cause overheating and damage to engine. Clean them frequently.

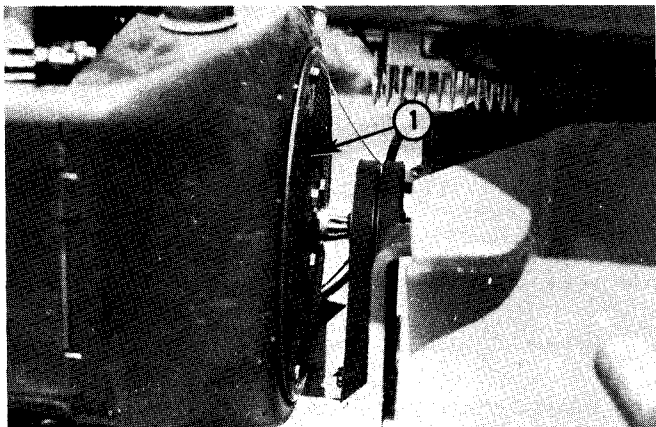


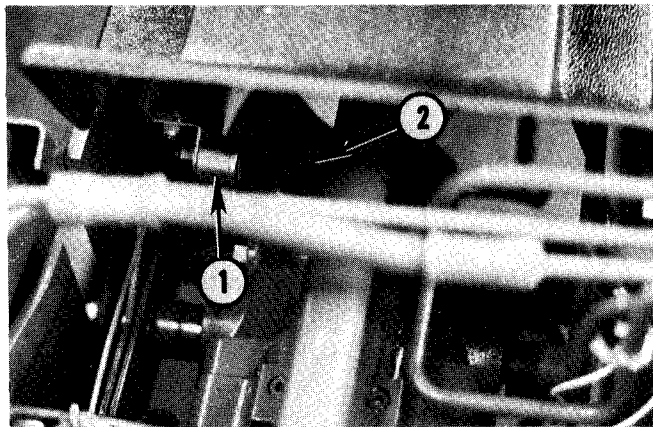
Fig. 24 — Rotary Screen

1. Rotary Screen

Frequently check transmission fan, Fig. 25, to see if it is running free and is clean.



CAUTION: To prevent a fire hazard, keep engine fins and surrounding area free of grass, leaves and excessive grease.



**Fig. 25 — Transmission Cooling Fan —
Rear View — Seat Raised**

1. Safety Switch — Neutral Return Brake Pedal
2. Transmission Cooling Fan

SERVICING

This Section is concerned with procedures beyond normal maintenance and care. Most of these operations require above average mechanical ability. It is recommended that these services be performed at least annually. Such services are available at your Snapper Dealer.



CAUTION: Never operate engine in a poorly ventilated area. Carbon monoxide is odorless, tasteless and deadly.

Never make adjustments on Tractor with engine running unless absolutely necessary. If necessary, exercise extreme caution. Do not wear loose clothing that might become entangled in moving parts.

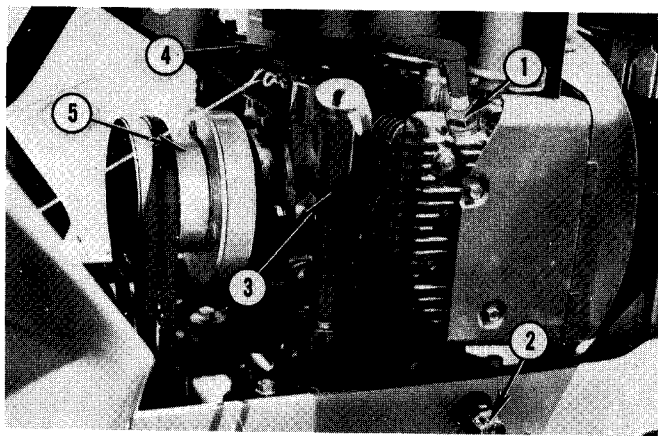


Fig. 26 — Engine — Left Side

1. Spark Plug
2. Engine Crankcase Drain Plug
3. Engine Dipstick and Fill Point
4. Breaker Point Case
5. Implement Drive Clutch

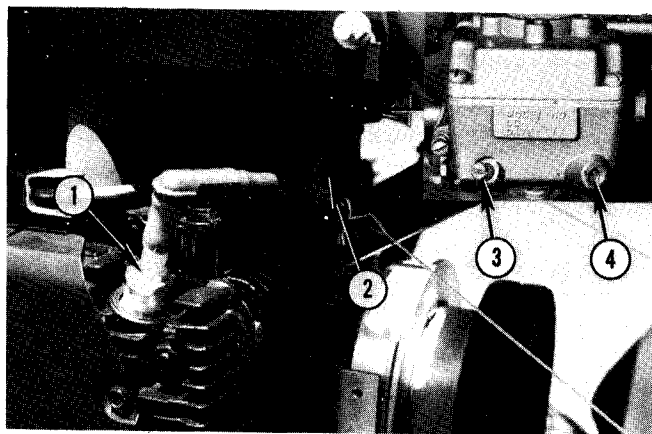


Fig. 27 — Engine — Right Side

1. Spark Plug
2. Breaker Point Case
3. Idle Mixture Screw
4. High Speed Mixture Screw

SPARK PLUG — FIGS. 26 AND 27

Remove plug and check its condition every 100 hours of operation or annually. If gapping is needed, set at .025". Do not sandblast, wire brush or scrape plug. If needed, replace plug with Champion RH 8.

BREAKER POINTS

The point cover is located on front of engine, Fig. 26. Check and service at least every 200 hours of operation or annually. If oxidized, oily or dirty, clean with a coarse cloth. Do not use emery cloth or sandpaper. Replace badly pitted or burned points. To adjust, turn engine over by hand until points are at maximum opening. Check gap with feeler gauge. If gap is not .025", loosen retaining screw and shift plate until proper gap is obtained. Retighten screw, then recheck gap when points are fully open. Replace condenser if necessary.

With engine running ignition timing should be 25° B.T.C. 25° timing mark on flywheel is visible through air shroud after removing air intake duct.

ENGINE CYLINDER HEAD BOLTS

Within first 50 hours of operation, cylinder head bolts must be retightened to 14-16 ft.-lbs. torque (with engine at operating temperature). Follow sequence shown in Fig. 28.

CARBURETOR ADJUSTMENT — FIG. 27



CAUTION: Do not touch muffler while adjusting carburetor.

Lack of power and black sooty exhaust smoke usually indicates that fuel mixture is too rich. An

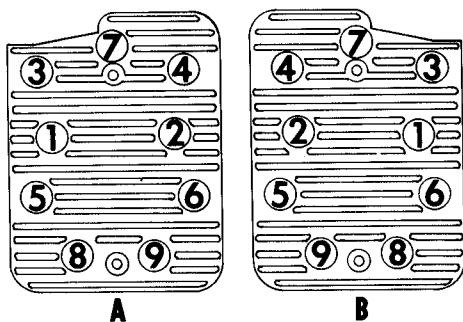


Fig. 28 — Cylinder Head Torque Sequence

A. No. 1 Cylinder

B. No. 2 Cylinder

overrich mixture may also be caused by a clogged air cleaner — check this before readjusting carburetor. Fuel mixture may be too lean if engine skips or backfires at high speed.

1. Stop engine, remove hood from Tractor and turn both fuel mixture screws in until they bottom (do not force), Fig. 27.

2. Turn high speed mixture screw out two turns and turn idle mixture screw out one turn. This is an initial setting.

3. Start engine and run at full throttle (do not exceed 3650 rpm), turn high speed mixture screw in until engine starts to slow down. Then turn screw out slowly until engine regains full speed. If adjusted properly, engine should accelerate smoothly and operate at a steady governor speed. If it doesn't open adjustment screw slightly.

4. Operate engine at about 1200 rpm and turn idle mixture screw in until engine slows down (runs rough) then open screw until engine runs smooth.

5. Reset idle speed to 1800-2000 rpm.

NOTE: If these adjustments do not correct carburetor problems, carburetor should be removed and overhauled.

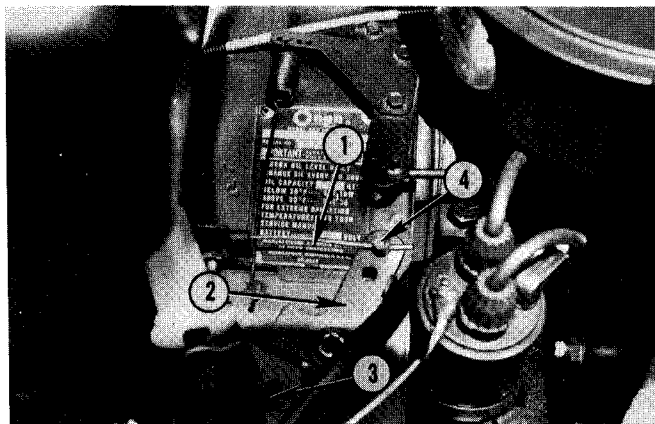


Fig. 29 — High Speed Adjustment

1. Throttle Control Wire
2. Bellcrank

3. Stop Pad
4. Set Screw

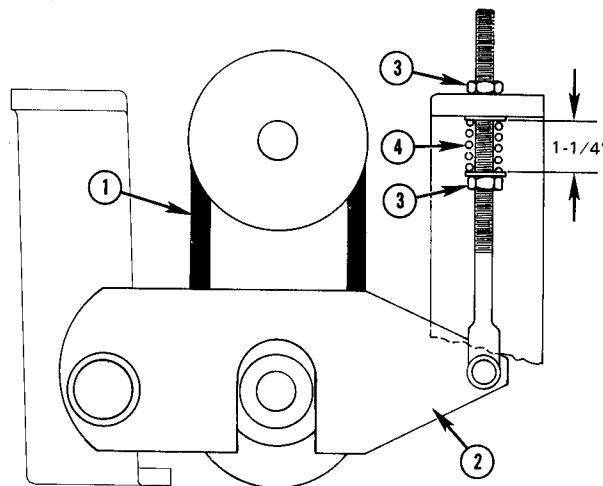


Fig. 30 — Traction Drive Belt Adjustment

1. Belts
2. Pulley Bracket

3. Adjusting Nuts
4. Spring

GOVERNOR ADJUSTMENT

Governor functions to maintain engine speed under changing load conditions and also acts as a speed limiting device. Governors are set at factory and further adjustment should not be required unless linkage works loose or becomes disconnected. Readjustment should be made if engine surges with changing load or if speed drops considerably when a normal load is applied.

To adjust high speed setting (no load governed speed): Position set screw on end of throttle control bellcrank so that when control lever on dash is in forward position rearward arm of bellcrank is against stop of fixed bracket, Fig. 29. This should provide 3600 rpm engine speed. If it does not bend stop pad to achieve 3600 rpm. It may be necessary to reposition throttle control wire in set screw on bellcrank.

TRACTION DRIVE BELT ADJUSTMENT

Proper tension of traction drive belts is when length of spring, No. 4, Fig. 30, is 1-1/4". Check measurement and if necessary adjust nuts, No. 3, until correct spring length is obtained (1-1/4").

TRACTION DRIVE BELT REPLACEMENT

NOTE: Belts must be replaced as a matched set.

1. Loosen lower adjusting nut, No. 3, raise lower pulley bracket, No. 2, and remove belts, No. 1.

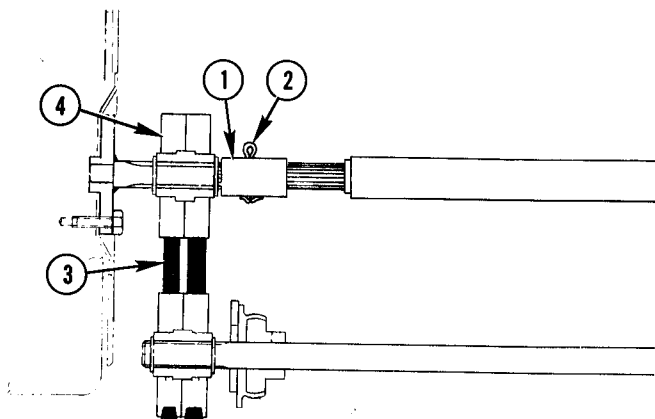


Fig. 31 — Traction Drive Belt Replacement

- | | |
|---------------|-----------------|
| 1. Coupling | 3. Belts |
| 2. Cotter Pin | 4. Upper Pulley |

2. Remove cotter pin, No. 2, Fig. 31. Slide coupling, No. 1, rearward and remove belts, No. 3, from upper pulley, No. 4.

3. Install new set of belts around upper and lower pulleys.

4. Slide coupling forward and secure with cotter pin.

5. Adjust belt tension.

REAR PTO BELT ADJUSTMENT

To adjust belt tension on rear PTO:

1. Loosen nut, No. 1, Fig. 32.

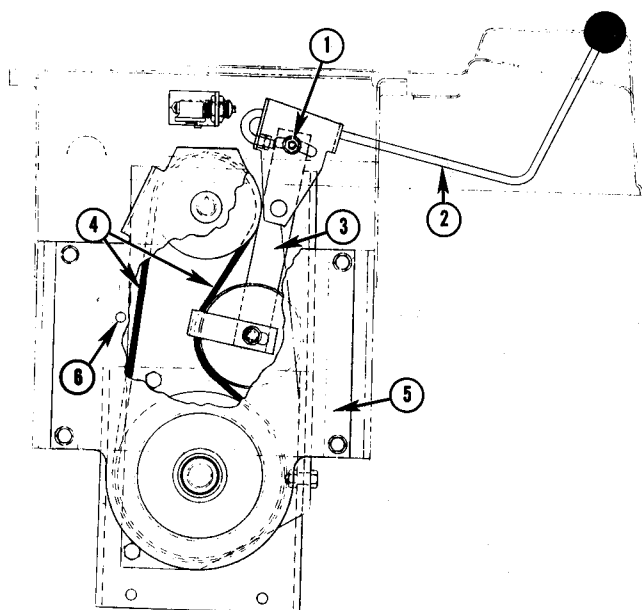


Fig. 32 — Rear PTO Belt Adjustment

- | | |
|-------------------------|--------------------------|
| 1. Adjusting Nut | 4. Bolts |
| 2. Control Lever | 5. PTO Cover Plate |
| 3. Idler Arm and Pulley | 6. Belt Guide Keeper Pin |

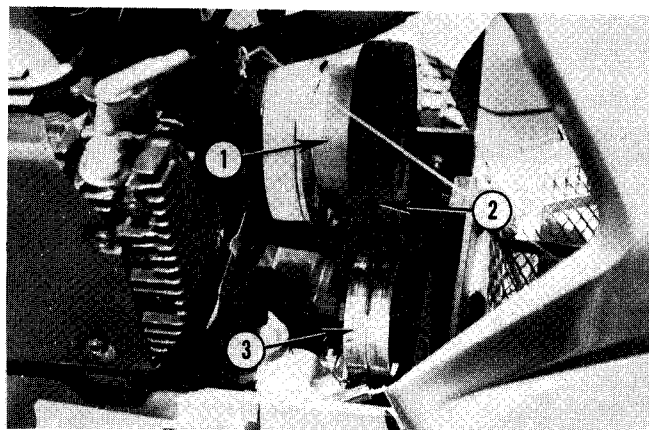


Fig. 33 — Mid PTO Belt Replacement

- | |
|------------------------|
| 1. Electric Clutch |
| 2. Belts |
| 3. Spring-Loaded Idler |

2. Push idler arm and pulley, No. 3, towards centerline of Tractor to remove slack from belts, No. 4.

3. Place control handle, No. 4, Fig. 3, in center of slot in fender.

4. Tighten nut, No. 1, while maintaining relative position of idler arm and lever (Steps 2 and 3).

5. Spring steel handle then provides sufficient force to properly tension V-belts in engaged position.

NOTE: This can be done without removing fender or rear PTO cover plate.

REAR PTO BELT REPLACEMENT

NOTE: Belts must be replaced as a matched set.

1. Remove rear PTO cover plate, No. 5, Fig. 32, and loosen belt tension.

2. Remove old belts and install matched set of new belts.

3. Adjust belt tension and reinstall PTO cover plate. Care should be taken when replacing PTO cover to insure that the belt guide keeper pin, No. 6, Fig. 32, is outside of belts.

IMPLEMENT AND MID PTO BELT REPLACEMENT

NOTE: Belts must be replaced as a matched set.

1. Remove PTO cover.

2. Relieve tension of belts, No. 2, Fig. 33, by pulling spring-loaded idler, No. 3, outward with one hand, then remove belts from pulleys with other hand.

3. Install matched set of new belts around pulleys and carefully release idler pulley.

4. Reinstall PTO cover.

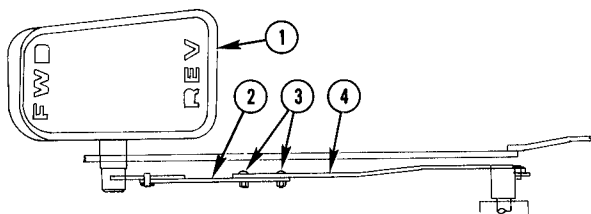


Fig. 34 — Forward/Reverse Pedal Adjustment

1. Forward/Reverse Pedal
2. Front Control Link
3. 1/4" x 3/4" Round Head Bolts and Hex Flange Lock Nut
4. Transmission Control Link

FORWARD/REVERSE PEDAL ADJUSTMENT

Loosen nuts, No. 3, Fig. 34, then with right foot tilt forward/reverse pedal, No. 1, until operation of pedal is comfortable. Tighten nuts.

TRANSMISSION AND BRAKE TEST — FIG. 35

Before attempting to adjust transmission control and brake linkage perform following to determine if adjustment is necessary.

Drive Tractor in following manner:

1. Mount Tractor.
2. Adjust seat position to allow comfortable operation of transmission, heel and toe, control pedal.

NOTE: Speed control and parking brake latch lever must be in upper No. 4 position and operator's left foot must be off neutral return and brake pedal.

3. Place rear axle shift lever in low speed range.
4. Depress neutral return and brake pedal.
5. Start engine.
6. Remove left foot from pedal.
7. Place right foot on heel and toe pedal.
8. Tilt right foot to rotate toe end of pedal downward and forward. Tractor should travel forward.
9. Remove right foot from pedal. Tractor should stop and remain stationary.
10. Place right foot on pedal and tilt foot to rotate heel end of pedal downward. Tractor should travel rearward.

11. Remove right foot from pedal. Tractor should stop and remain stationary.

12. To check disc brake drive Tractor at maximum forward speed, then flip rear axle shift lever to neutral position and depress neutral return brake pedal. Rear Tractor wheels should slide.

NOTE: While neutral return brake pedal is being depressed with left foot, heel and toe pedal will automatically return to neutral position.

TRANSMISSION ADJUSTMENT PROCEDURE

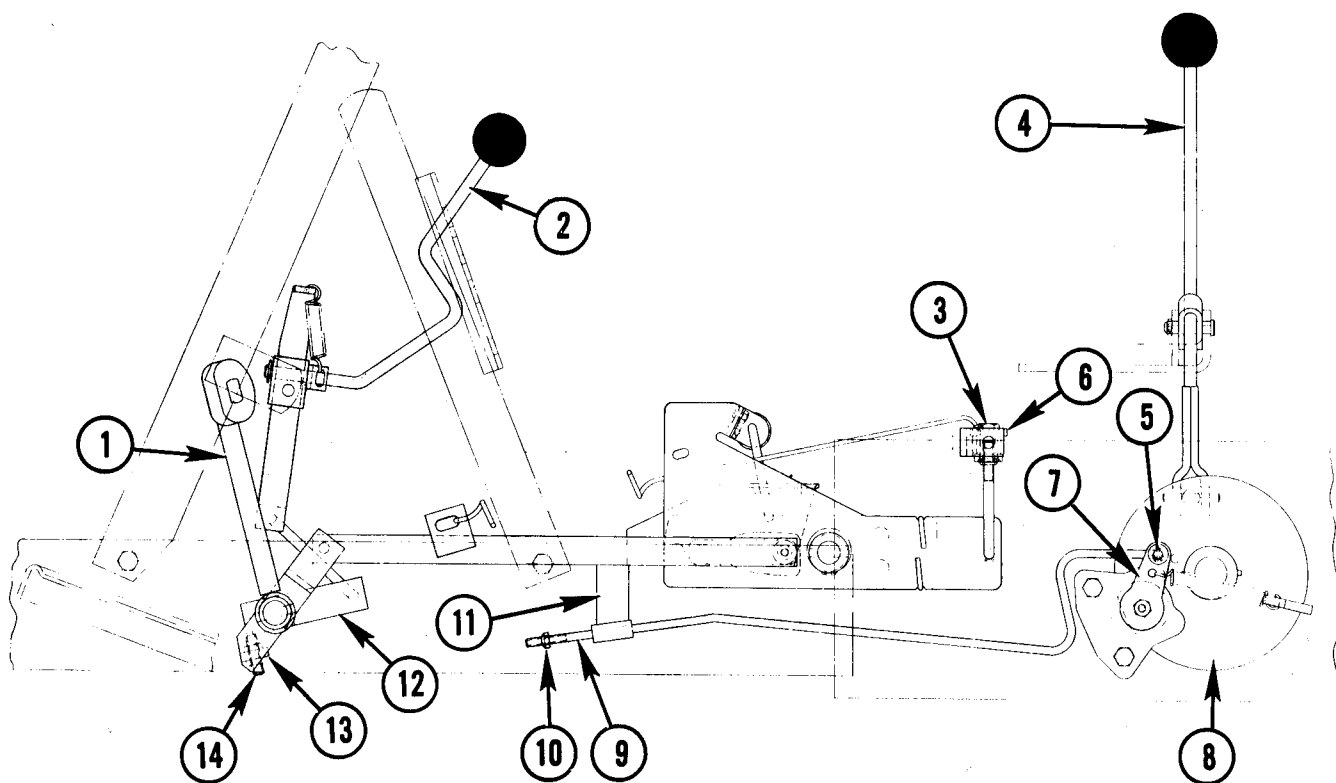
1. Block Tractor up securely so that one or both rear wheels are off ground.
2. Increase effective length of brake rod, No. 9, Fig. 35, by backing off adjusting nut, No. 10, to end of rod.
3. Place speed control and parking brake latch lever, No. 2, in parking brake notch lowest position.
4. Depress neutral return and brake pedal, No. 1, until pedal pad rests on stop plate. Then adjust setscrew, No. 14, to achieve zero clearance between end of setscrew and link selector, No. 12. Then tighten jam nut, No. 13.
5. Move rear axle shifting lever, No. 4, to low range position and start engine. Run engine at idle speed.
6. Remove cotter pin and retainer, No. 6, then adjust stud, No. 3, clockwise or counterclockwise until Tractor wheels stop rotating. Continue turning adjustment stud till wheels commence rotating in opposite direction. Reverse direction of adjustment slightly to bisect dwell interval. Replace retainer and cotter pin. Bend long leg of cotter pin.
7. Depress neutral return and brake pedal and move speed control and parking brake latch lever to upper notch. Allow pedal to rise.

NOTE: Do not attempt to move speed control and parking brake latch lever unless neutral return and brake pedal is depressed to take pressure off lever.

8. Depress forward end of forward-reverse pedal. Wheels must rotate in forward direction. Remove pressure from pedal allowing it to return to neutral automatically. Wheels must stop within seven seconds.
9. Depress reverse end of forward-reverse pedal. Wheels must rotate in rearward direction. Remove pressure from pedal allowing it to return to neutral automatically. Wheels must stop within seven seconds.

BRAKE ADJUSTMENT

1. Turn adjusting nut, No. 5, Fig. 35, on brake assembly,



**Fig. 35 — Transmission Control and
Brake Adjustment**

- | | |
|--|-----------------------------|
| 1. Neutral Return Brake Pedal | 8. Brake Disc |
| 2. Speed Control/Parking Brake Lever | 9. Brake Rod |
| 3. Adjusting Stud | 10. Brake Rod Adjusting Nut |
| 4. Rear Axle Shifting Lever | 11. Brake Rod Guide |
| 5. Adjusting Nut | 12. Selector Link |
| 6. Cotter Pin and Retainer | 13. Hex Nut |
| 7. Brake Assembly — Brake Pucks Behind | 14. Setscrew |

No. 7, clockwise to eliminate clearance between brake pucks and brake disc, No. 8. Then back off one-half turn. This provides .020" running clearance for brake disc.

2. Depress neutral return brake pedal and latch by moving speed control and parking brake latch lever to lowest position.

3. While pulling brake rod forward with 10-20 lbs. tension, turn brake rod adjusting nut, No. 10, clockwise until it contacts tubular brake rod guide, No. 11, portion of strap assembly. Continue to tighten nut two additional turns.

each end of tie-rod, No. 1, and turn tie-rod until correct toe-in is obtained.

TOE-IN

With wheels pointed straight ahead, check toe-in by measuring distance between front wheels at front and rear, Fig. 36. Dimensions at front edge should be 1/8" less than at rear. If adjustment is needed, loosen tie-rod lock nut, No. 2, Fig. 37, at

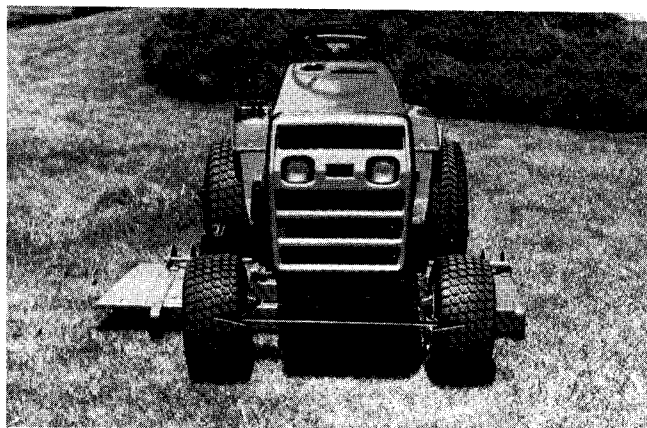


Fig. 36 — Toe-In Adjustment

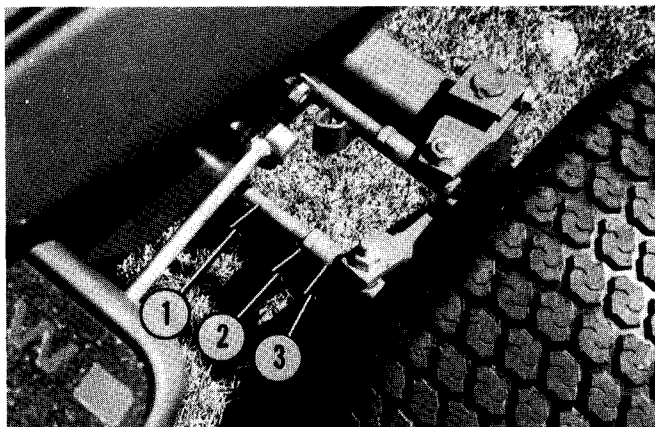


Fig. 37 — Toe-In Adjustment

1. Tie-Rod 2. Lock Nut 3. Ball Joint

WIRING

Should wiring become disconnected, or require replacement, refer to wiring diagram, Page 26, for proper connections.

TRACTOR STORAGE

If Tractor is to be idle for an extended period of time, it should be prepared for storage.

1. Store Tractor in a dry area where it will be protected from weather.

2. Open fuel shut-off valve, No. 1, Fig. 23, and drain all fuel from tank, close valve. Start engine and run until it runs out of fuel.

3. Remove spark plugs, No. 1, Figs. 26 and 27, and put a tablespoon of engine oil into spark plug holes. Turn engine over two or three times with starter and regap spark plugs to .025" and replace. Leave spark plug wires disconnected.

4. Lubricate fully as described in "Lubrication" Section.

5. Remove battery, clean case and terminals thoroughly. Coat terminals with a thin coating of petroleum jelly. Charge battery and store in a cool dry place. Do not store on a cement floor. Recharge at least monthly while in storage.

REMOVING TRACTOR FROM STORAGE

1. Install fully charged battery, placing boot over positive terminal.

2. Clean or replace air filter element. Refer to "Maintenance" Section for procedure.

3. Check crankcase oil level. If needed, drain after running engine until warm, and refill.

4. Move Tractor outside and fill fuel tank. Connect spark plug wires and run engine several minutes before placing Tractor under load.

5. Check transmission oil level. Fill using procedure prescribed in "Lubrication" Section.

6. Check tire pressures. Refer to "Maintenance" Section for correct pressures.

IGNITION SWITCH

The ignition switch has 4 positions as follows.

1. Off and key removal.
2. On/Running with lights.
3. On/Running without lights.
4. On/Start.

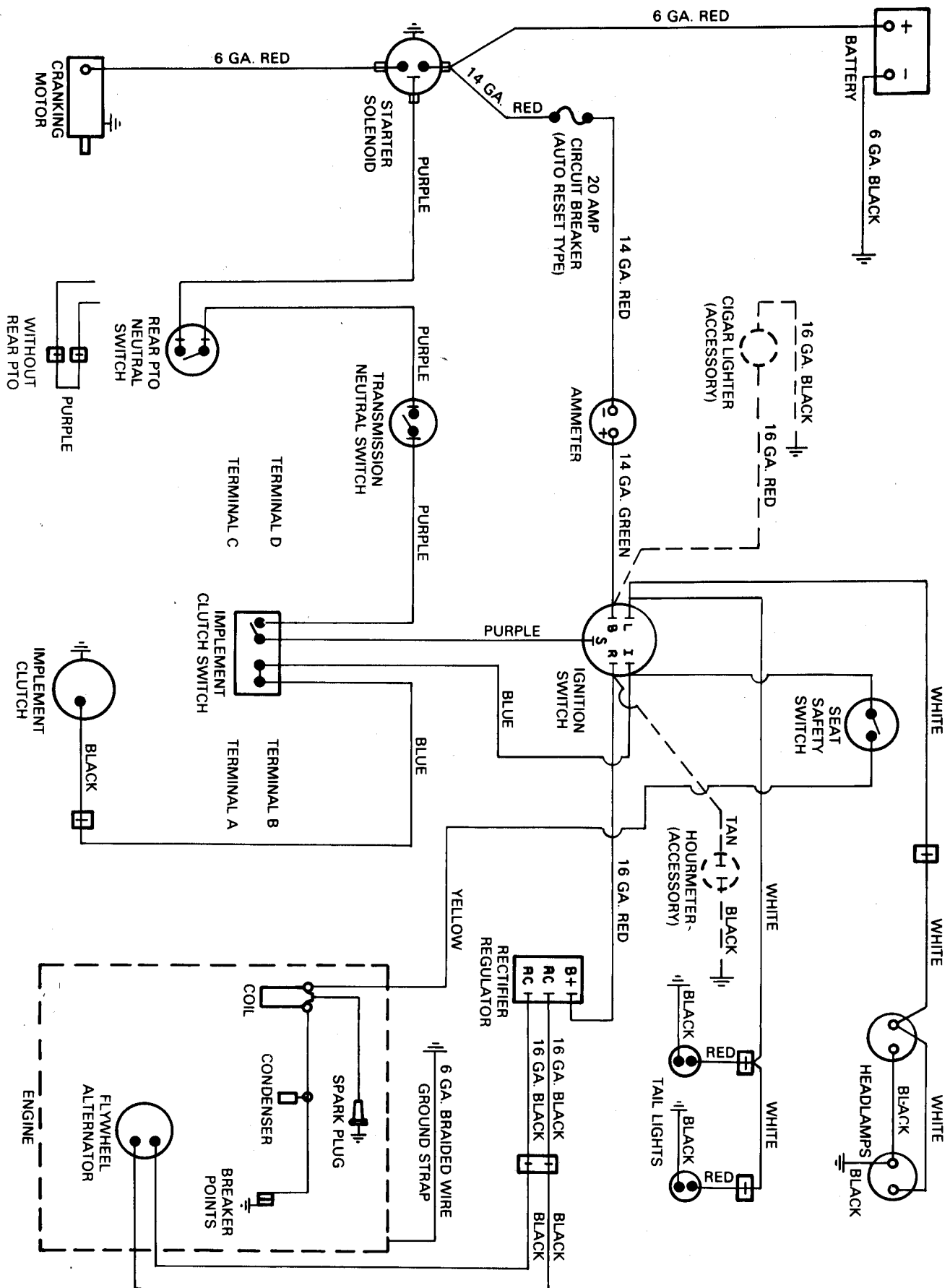
SAFETY START SWITCHES

The function of these switches is to allow the engine to start when the following safe starting conditions exist.

1. Operator seated in tractor's seat.
2. Clutch/Brake pedal depressed.
3. Front PTO switch in OFF position.
4. Rear PTO (if tractor so equipped) lever in OFF position.

The mechanism controlling condition, No. 1, above is in the engine ignition circuit. The mechanisms controlling conditions, No. 2, 3 and 4, above are in the engine cranking circuit. Therefore, it is important to remember that ALL these safe starting conditions must exist before the engine will start. Also, if safe starting conditions, Nos. 2, 3 and 4, exist the engine *will crank over* using the starter *but will not start* if safe starting condition, No. 1, is not existing.

For repair of any of these safety start mechanisms, contact your Snapper Dealer.



Wiring Diagram

TROUBLE-SHOOTING

NOTE: Neutral return switch and rear PTO switch must make a circuit when pedal is down and rear PTO lever is in disengaged position. Seat switch has an open circuit when seat is "Up" and makes a circuit when operator is seated.

ENGINE

HARD STARTING OR LOSS OF POWER

1. Faulty ignition.
 - a. Leads grounded or loose.
 - b. Breaker points faulty or improperly gapped.
 - c. Spark plug faulty or improperly gapped.
 - d. Coil or condenser defective.
2. Faulty carburetion.
 - a. Fuel line or filter clogged (dirt, gum, etc.).
 - b. Fuel pump faulty.
 - c. Carburetor dirty or improperly adjusted.
3. Poor compression.
 - a. Head loose or gasket leaking.
 - b. Valves sticking or leaking.
 - c. Piston rings worn.

WON'T START

Check safety switches.

1. If engine won't crank check neutral return brake pedal and rear PTO switch.
2. If engine cranks but does not start check seat switch.

OPERATING ERRATICALLY

1. Clogged fuel line.
2. Water in fuel.
3. Vent in gas cap plugged.
4. Faulty fuel pump.
5. Gasket leaking (carburetor-manifold).
6. Governor improperly set.
7. Carburetor improperly adjusted.

KNOCKING

1. Fuel octane too low.
2. Ignition timing wrong.
3. Carbon build-up in combustion chamber.
4. Engine overheated.

OCCASIONAL SKIP AT HIGH SPEED

1. Spark plug fouled, faulty or gap too wide.
2. Ignition timing wrong.
3. Carburetor improperly adjusted.
4. Breaker points faulty or improperly adjusted.

OVERHEATING

1. Air intake screen or fins clogged.
2. Oil level too high (or low).
3. Fuel mixture too lean.
4. Ignition timing wrong. Spark too far advanced.
5. Engine overloaded.
6. Tappet clearance too close.

IDLES POORLY

1. Idle speed too low.
2. Idle fuel improperly adjusted.
3. Gasket leaking (carburetor-manifold).
4. Spark plug gap too close.

BACKFIRING

1. Carburetor set too lean (main fuel).
2. Breaker points improperly gapped (timing).
3. Valve sticking.

TRACTOR SPECIFICATIONS

ENGINE:

Model Onan
Horsepower 18 hp at 3600 rpm
Bore 3-1/4 inches
Stroke 2-7/8 inches
Displacement 48 cubic inches
Crankcase Capacity 3-1/2 pts. — 4 pts. with filter change
Idle Speed 1800-2000 rpm
Governed Speed (No Load) 3500-3650 rpm
Spark Plug Gap025"
Breaker Point Gap025"

TRANSMISSION:

Model Eaton Model 11.
Implement Relief Valve 700-750 psi above case pressure
Transaxle Peerless No. 2520 — 2 speed
System Capacity 5 U.S. qts.

FUEL TANK:

Capacity 3.5 gallons
Battery 12 volt — 43 ampere hour

CHASSIS:

Wheelbase 52 inches
Length (Overall) 78 inches
Width 45.5 inches
Height (Over Steering Wheel) 48 inches
Ground Clearance (at Rear Axle) 8 inches
Front Wheel Tread 32 inches
Rear Wheel Tread 33-1/2 inches
Drawbar Height 8-1/4 inches

TIRES:

Front 18 x 8.50-8 2 Ply Softrac Terra
Rear 26 x 12-12 2 Ply Super Terra Grip

Front PTO Standard
Rear PTO — Standard Speed 2000 rpm
Hydraulic 3-Point Lift Linkage Standard
Weight (Approx.) without Mower 860 lbs.

ACCESSORIES: See your Snapper Dealer

ROTARY MOWER

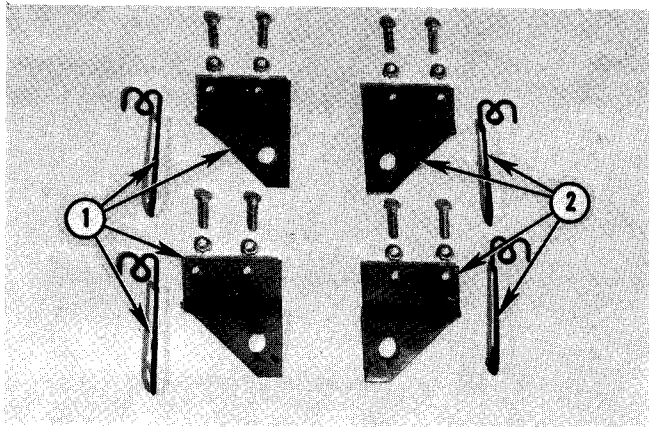


Fig. 38 — Mower Anchor Plates

- 1. Left Side
- 2. Right Side

INSTALLATION

PREPARING THE TRACTOR (MID-MOUNT MOWERS)

1. Select four mower anchor plates, spring retainers and attaching hardware from mower carton. Note that there are two left and two right anchor plates and spring retainer, Fig. 38.
2. Prior to attaching to Tractor frame, position retainer springs on anchor plates as shown in Fig. 39.
3. Install anchor plates and retainer springs on the inside of Tractor frame as shown in Figs. 40 and 41.
4. Install hanger straps on Tractor as shown in Figs. 42 and 43. Fig. 42 is an underside view of the Tractor looking rearward. Fig. 43 is a top side view with center cover removed. Note that hanger straps are positioned on the left side of the rockshaft lift arms and that the connector pins on lower end of hanger straps point to the right. There is a right and left hanger strap.

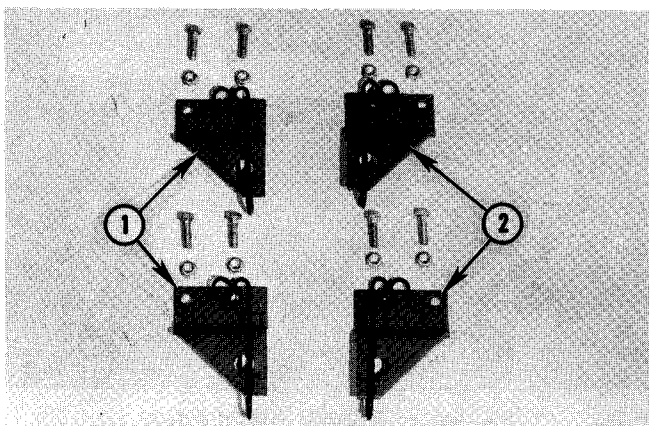


Fig. 39 — Mower Anchor Plates

- 1. Left Side
- 2. Right Side

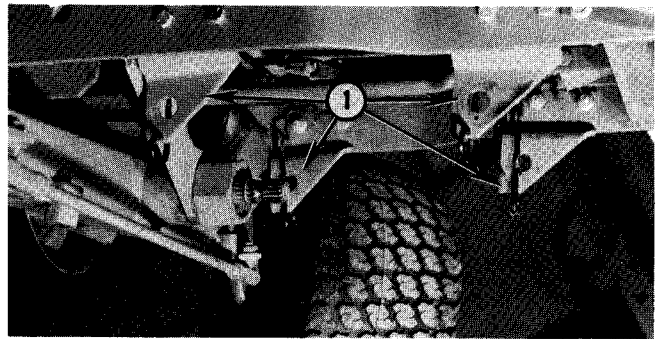


Fig. 40 — Anchor Plates Installed

- 1. Anchor Plates

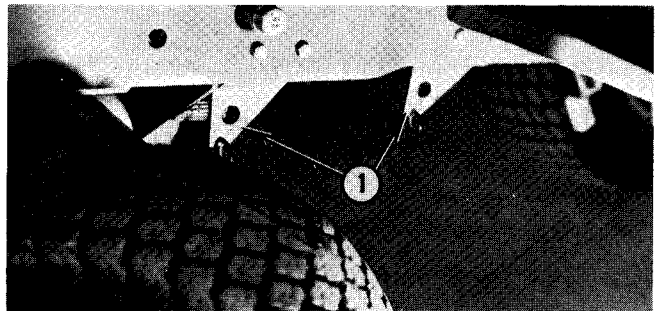


Fig. 41 — Anchor Plates Installed

- 1. Anchor Plates (Left Side)

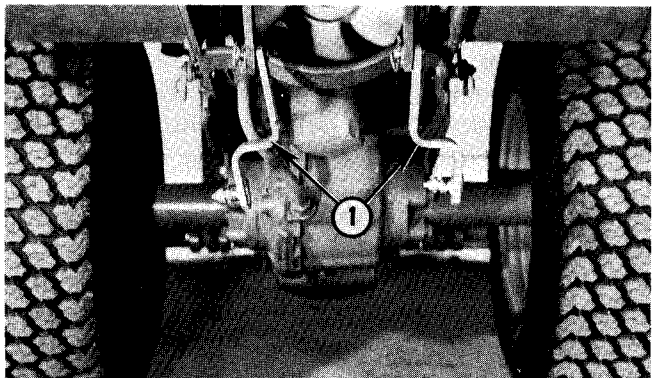


Fig. 42 — Hanger Straps Installed

- 1. Hanger Straps

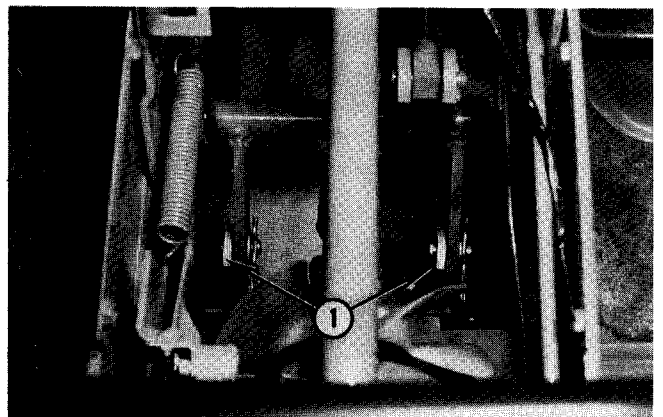


Fig. 43 — Hanger Straps Installed

- 1. Hanger Straps

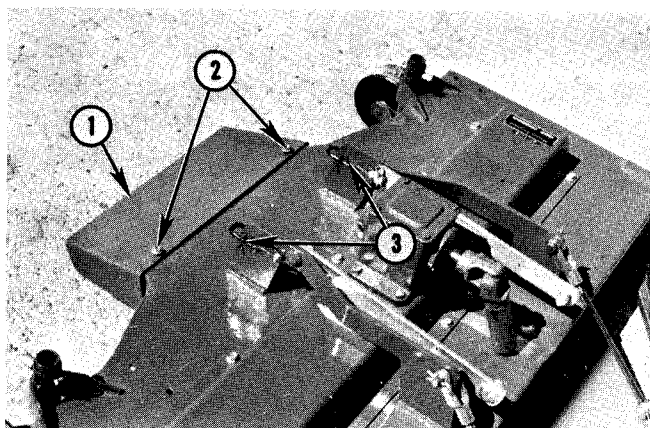


Fig. 49 — Deflector Chute

- 1. Chute
- 2. Retaining Bolts
- 3. Spring Retainers

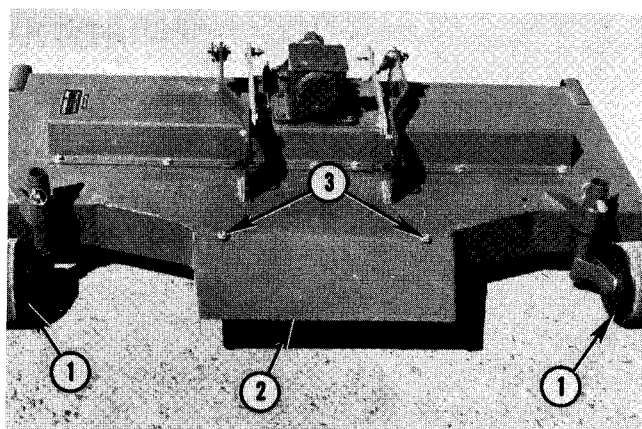


Fig. 51 — Gauge Wheels and Deflector Chute

- 1. Gauge Wheels
- 2. Deflector Chute
- 3. Bolts

PREPARING MID-MOUNT MOWER

NOTE: Preparation of the side and rear discharge mowers is the same except that rear deflector chute should not be installed until after mower is positioned under Tractor.

1. Install hanger strap retainer springs as shown in Fig. 49.
2. Install PTO drive shaft on mower gear box using woodruff key and groove pin, Fig. 50.
3. Install lift links on mower as shown in Fig. 50. Note that point ends of all four lift links point inward or toward mower center.
4. Install gauge wheels as shown in Fig. 51.
5. Install side or rear deflector chute with bolt heads down, Fig. 51.

ATTACHING MID-MOUNT MOWER TO TRACTOR

1. Slide mower under Tractor or using mounting ramp (accessory), drive Tractor over mower. See instructions on Page 33 for proper use of mounting ramps.

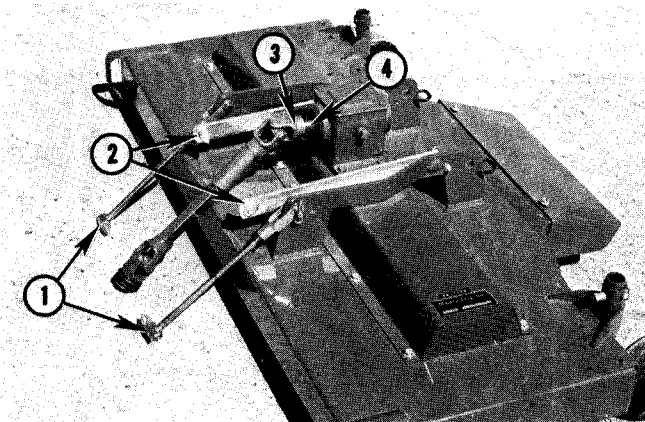


Fig. 50 — Lift Link Installation

- 1. Front Links
- 2. Rear Links
- 3. Groove Pin
- 4. Woodruff Key

2. Start Tractor engine, lower hanger straps No. 4 Fig. 52 and then shut off engine.

3. Attach lift arms, No. 3, Fig. 52, to anchor plates, No. 1, and hanger straps No. 4, to mower. Secure in place with spring link retainers, No. 2.

NOTE: Hanger straps are installed on left side of mower mounting brackets.

4. Place rear gauge wheels in full up position.
5. Place a 2×4 edgewise under the front edge to raise the front of the mower approximately 1/4 to 1/2 inch above the rear of mower.
6. Attach yoke end of front lift links to mower and then rotate lift link until the correct length fits snugly into front anchor plate, Fig. 53.
7. Install PTO drive shaft on Tractor and secure with sliding lock, Fig. 54.
8. If mower is not level refer to "Levelling" Page 34.

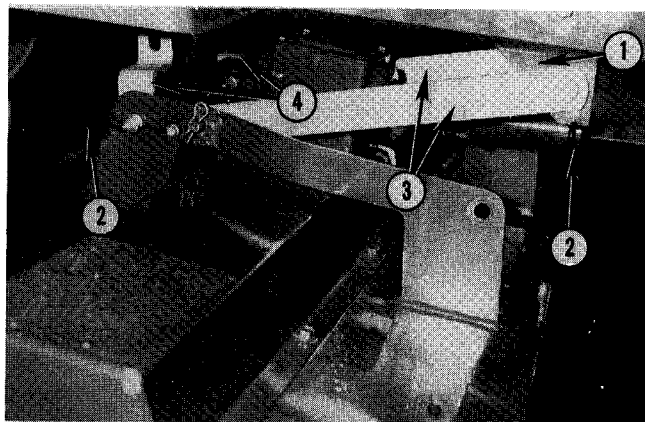


Fig. 52 — Mower Installation

- 1. Anchor Plate
- 2. Link Springs
- 3. Lift Arms
- 4. Hanger Straps

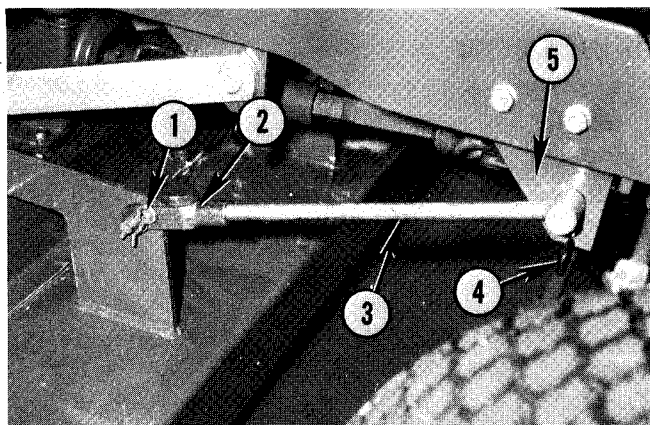


Fig. 53 — Mower Installation

- | | |
|----------------------------|----------------|
| 1. Clevis Pin and Hair Pin | 3. Lifter Link |
| 2. Yoke | 4. Link Spring |
| 5. Anchor Bracket — Front | |

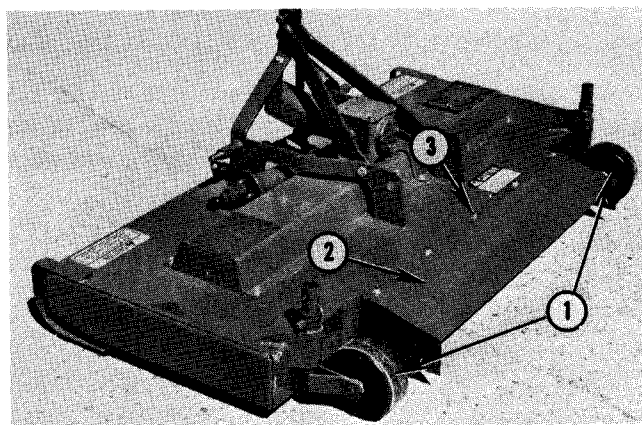


Fig. 55 — Gauge Wheels and Deflector Chute

- | |
|--------------------|
| 1. Gauge Wheels |
| 2. Deflector Chute |
| 3. Bolts (5) |

PREPARING 54" 3 PT HITCH MOWER

1. Install gauge wheels and deflector chute as shown in Fig. 55 with chute bolt heads down.

2. Assemble "A" frame and mower PTO shield as shown in Fig. 56.

ATTACHING 54" 3 PT HITCH MOWER

1. Place gauge wheels in full up position and 2×4 edgewise under front edge to level mower, Fig. 57. This places mower in level position and front part of "A" frame in vertical position as viewed from the side, Fig. 57.

2. Install front portion of PTO shaft onto rear portion by sliding the two together, Fig. 58.

3. Place Tractor 3-point hitch check chains in rear hole, Fig. 59.

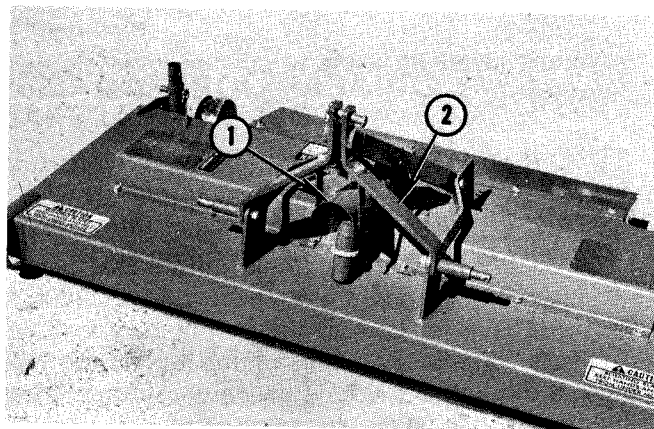


Fig. 56 — "A" Frame Assembly

- | |
|---------------------|
| 1. Mower PTO Shield |
| 2. "A" Frame |

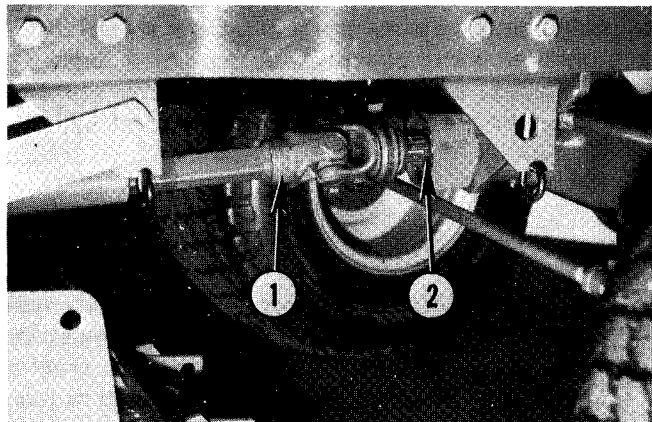


Fig. 54 — Mower Installation

- | |
|----------------------|
| 1. Mower Drive Shaft |
| 2. Mid PTO Shaft |

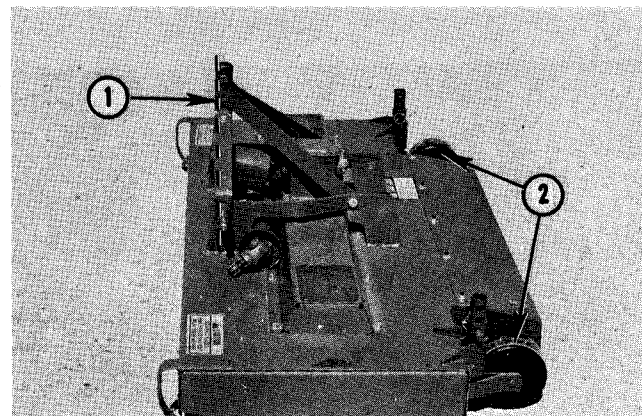


Fig. 57 — Attaching Mower

- | |
|-----------------------|
| 1. Vertical "A" Frame |
| 2. Gauge Wheels |

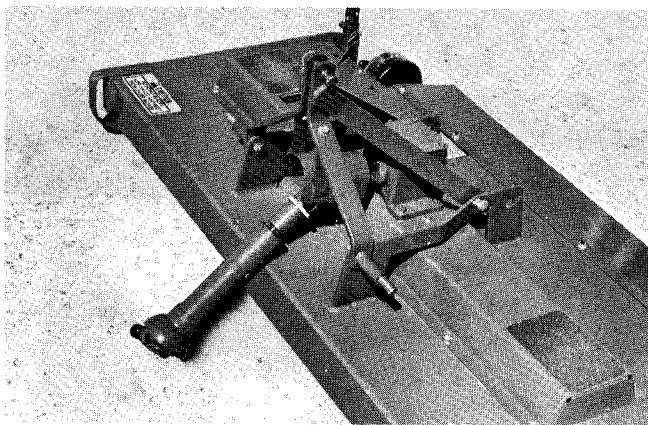


Fig. 58 — PTO Shaft Installation

4. Back Tractor up to within a few inches of mower, shut off engine and lower Tractor 3-point hitch lift arms, Fig. 60.

5. Attach lower lift arms to pins on lower mower "A" frame.

NOTE: If after installing first lift arm the other is not level with its pin remove hair pins in adjustable lift links and screw up or down as necessary by turning "T" handles, Fig. 60.

6. Install Tractor top link in top of mower "A" frame. If top link is too long or too short loosen jam nut and adjust as necessary being certain to retighten jam nut when top link is in place.

7. Install splined front end of PTO shaft into Tractor rear PTO drive and secure in place by pulling out lock ring on Tractor.

8. If mower is not level refer to "Levelling" Page 34.

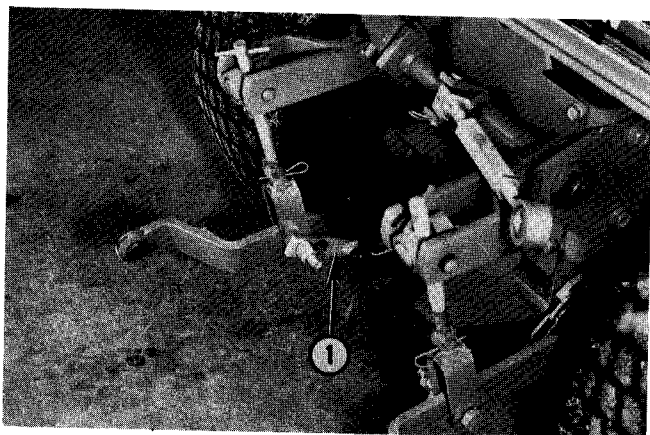


Fig. 59 — Check Chains

1. Check Chain

OPERATION



CAUTION: Never operate Mower with shields removed.

Always check area to be moved before operating. Remove sticks, stones, bones or other material that could come in contact with blades and be thrown and cause injury to persons, or damage to implement. Take note of any obstructions that cannot be moved and might be difficult to see when operating. Mark small pipes, curbs or other objects that are difficult to see, as a warning.



CAUTION: To prevent possible injury, do not adjust the cutting height until the engine has been turned off and the blades have stopped rotating.

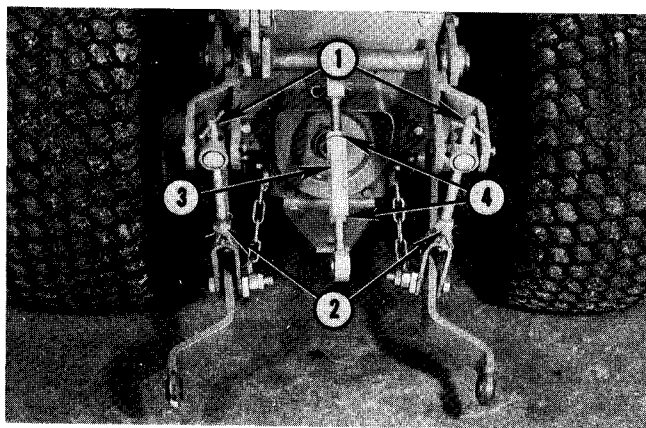


Fig. 60 — 3-Point Hitch

1. "T" Handles 3. Top Link
2. Hairpins 4. Jam Nut

Should anything solid come in contact with mower blades, stop Tractor and shut-off engine immediately. Carefully inspect both Tractor and mower. If needed, make repairs or adjustments before proceeding. Mower blade drive is protected by shear pins in blade mounting assembly. If blades get out of time and strike each other stop immediately. Replace shear pins and retune blades. Blades can be retimed by shifting blade mounting assembly on square end of spindle shafts, Page 35.



CAUTION: Under no circumstances crawl under rear mount mower when in raised position to make checks, repairs, etc. Completely detach mower from Tractor, including PTO shaft, then tip mower rearward and securely block before attempting any repairs, check, etc. on underside of mower.

IMPORTANT: Check shear pins on all blades.

When crossing gravel driveways, walks, etc., or when in transport, always disengage implement drive and raise Mower all the way up.

To mow, proceed as follows:

1. While on Tractor seat, depress neutral return brake pedal and disengage both PTO drives. Start Tractor engine, allowing a few minutes for warm-up, and drive to area to be mowed.

2. In grass of normal height, lower Mower to desired cutting height. In unusually heavy grass or weeds, lower mower partially, go over area once, then go over area again with mower lowered to normal cutting height. Cutting height is adjustable by means of gauge wheels. Gauge wheels should be adjusted with mower in transport. Never attempt to adjust the cutting height with the gauge wheels on the ground.

3. Always operate with throttle set at from 3/4 to full throttle. Forward speed should be approximately 3.5 mph, under good conditions, for best mowing results.

4. Engage Mower drive.

5. Place speed control and transmission levers into desired range, then slowly move forward/reverse pedal forward. Do not mow in reverse with rear discharge mower.



CAUTION: Turn off engine while unclogging discharge chute.

DETACHING

MID MOUNT MOWERS

1. Raise Mower up with Mower lift and shut off Tractor engine. Place gauge wheels in full up position.

2. Lower mower to ground.

3. Disconnect four lift links from anchor plates.

4. Disconnect hanger straps and disconnect PTO shaft from mid PTO.

5. If mounting ramps are used simply put in place and back Tractor up and over Mower. See page 33 for proper use of mounting ramps.

6. If Mower mounting ramps are not used slide Mower out sideways from under Tractor but on rear discharge Mower remove discharge chute.

3-POINT HITCH MOWER

1. Raise Mower, shut off engine and place gauge wheels in full up position.

2. Lower Mower to ground or floor.

3. Disconnect top link at Mower and remove PTO shaft from Tractor.

4. Disconnect lower lift links from Mower.

5. Raise 3-point hitch when not in use and store top link in position shown in Fig. 61.

ATTACHING AND DETACHING MID MOUNT MOWERS USING MOUNTING RAMPS (ACCESSORY)

ATTACHING

NOTE: Rear discharge chutes must be removed.

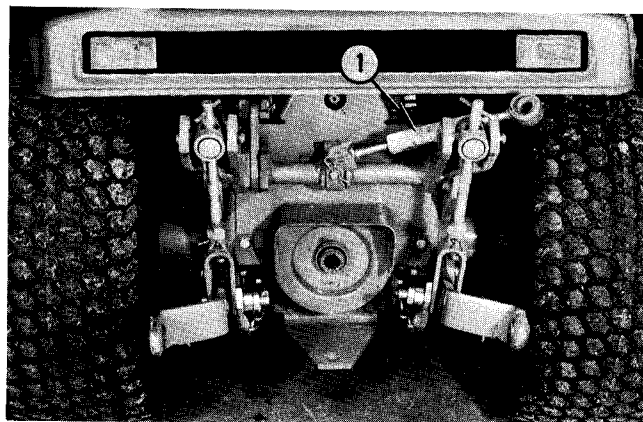


Fig. 61 — Top Link

1. Top Link

1. Position ramps on rear of Mower pan.
2. Drive Tractor front wheels up ramps until they are resting on belt shields and shut off engine.
3. Reposition ramps at front of Mower pan and then drive Tractor front wheels down them.
4. Shut off engine, remove ramps and proceed to attach Mower.

DETACHING

1. Detach Mower from Tractor.
2. Remove discharge chutes on rear discharge Mowers.
3. Position ramps at front of Mower.
4. Back Tractor up ramps until front wheels are resting on belt shield and shut off engine.
5. Reposition ramps at rear of Mower.
6. Start Tractor and back front wheels down ramps and clear of Mower.

MOWER ADJUSTMENTS

LEVELLING — MID MOUNT MOWERS

Tractor must be on level surface with tires properly inflated. (Refer to "Maintenance" Section for proper tire pressures.)

1. Place rear gauge wheels in full up position.
2. Place a two inch block under the front roller when required to raise the front of the mower approximately 1/4 to 1/2 inch above the rear of mower.
3. Allow mower to rest on gauge wheels.
4. Adjust front lift links so that they will snugly fit into front anchor plates.

NOTE: Mower should be level or sloping up slightly at the front when on a flat surface when resting on gauge wheels in the full up position.

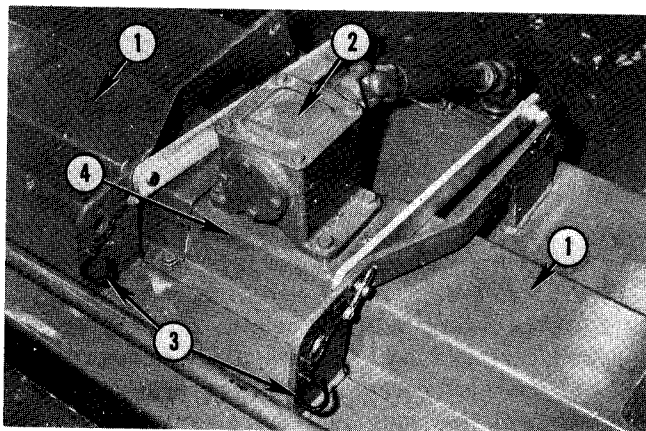


Fig. 62 — Belt Adjustment

- | | |
|----------------|-----------------------------|
| 1. Belt Covers | 3. Link Springs |
| 2. Gearbox | 4. Gearbox Mounting Bracket |

LEVELLING — REAR MOUNT 3-POINT HITCH MOWER

With tires properly inflated and mower and Tractor on a flat surface the mower is level when the "A" frame is vertical as viewed from the side. Any adjustments necessary to achieve this are accomplished by shortening or lengthening the Tractor top link.

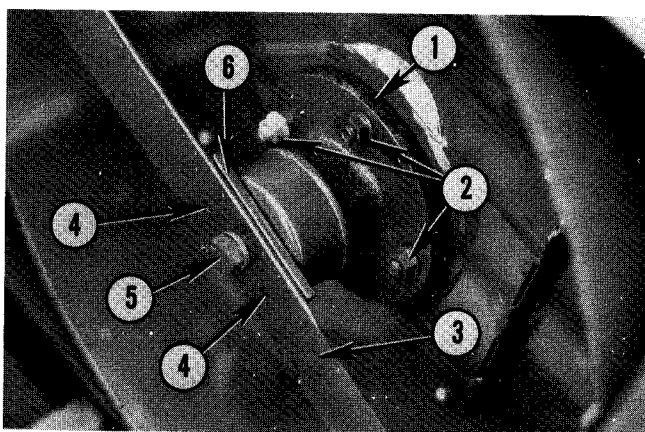


Fig. 63 — Belt Adjustment

- | |
|--|
| 1. Spindle Housing |
| 2. 3/8" x 1-1/8" Round Head Bolts and Flange Lock Nuts |
| 3. Mower Blade |
| 4. Shear Pins |
| 5. Bolt, Belleville Washer and Lockwasher |
| 6. Adaptor |

MOWER BELT TENSION

— FIGS. 62, 63 AND 64

1. Remove belt covers, No. 1, Fig. 62, and measure length of spring, No. 4, Fig. 64. If measurement is not 4.38" adjustment is necessary.
2. Loosen outboard spindle housing nuts, No. 2, Fig. 63, one turn.
3. Tap spindle housing, No. 1, under mower base with a hammer to overcome any friction at mounting bolts.
4. Loosen nuts, Nos. 1 and 2, Fig. 64, completely which will allow springs, No. 4, to move spindles outboard to tension belts.
5. Again check length of spring. If measurement is less than 4.38" remove washer, No. 3. If measurement is more than 4.38" add washers between spring and anchor bracket until spring length is correct.

6. Tighten nuts, Nos. 1 and 2, until there is 1/16" clearance between nut, No. 2, and anchor bracket.
7. Tighten spindle housing bolts, No. 2, Fig. 63, to 30-35 ft.-lbs. torque. Reinstall belt covers.

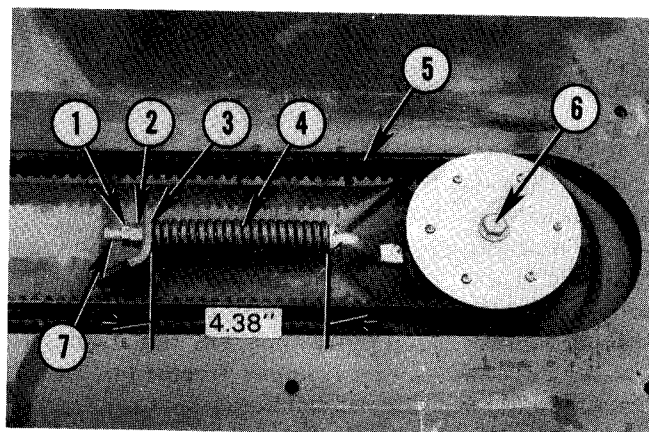


Fig. 64 — Belt Adjustment

- | | |
|-------------------------|-----------|
| 1. Jam Nut | 4. Spring |
| 2. Adjusting Nut | 5. Belt |
| 3. Washer | 6. Pulley |
| 7. Belt Tensioning Bolt | |

NOTE: Cover assembly removed for photographic purposes only.

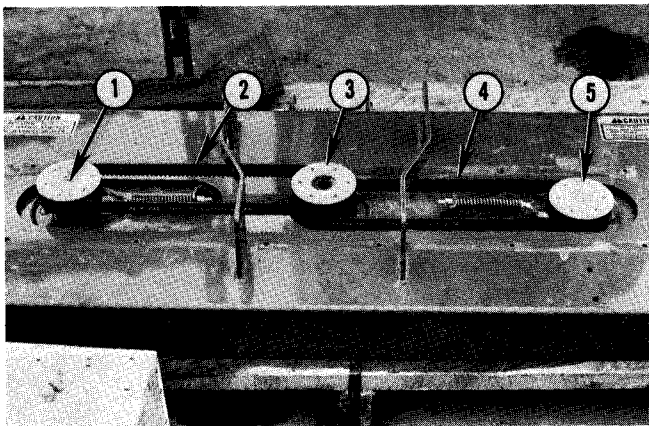


Fig. 65 — Belt Replacement

- | | |
|----------------------|-------------------|
| 1. Left-Hand Pulley | 3. Center Pulleys |
| 2. Top Belt | 4. Bottom Belt |
| 5. Right-Hand Pulley | |

NOTE: Cover assembly removed for photographic purposes only.

BELT REPLACEMENT — FIGS. 62, 63 AND 64

1. Remove mower from Tractor.
2. Remove belt covers and remove bolts securing gearbox mounting bracket, No. 4, Fig. 62, to mower and lift bracket and gearbox off. Gearbox output shaft is a slip fit in timing belt pulleys, No. 3, Fig. 65.
3. Back off nuts on outboard spindle housing mounting bolts one turn. Tighten nuts on belt tensioning bolts to bring outboard spindles inboard to slacken belts.
4. Remove top belt, then bottom belt. Install new belts in reverse order.
5. Adjust tension of bottom belt first then top belt, Page 35. Replace covers and gearbox.

NOTE: When reinstalling the gearbox extreme care should be taken to insure that the splined shaft of the gearbox is a free sliding fit in the center pulleys, No. 3, Fig. 65. The gearbox mounting bracket, No. 4, Fig. 62, is slotted to allow the gearbox to self center.

REPLACING BLADES

Wrap blade with heavy cloth and hold while loosening bolt. Note order components are taken off so they can be replaced same way. Blades are attached to spindle by means of blade adaptor, two shear pins and a bolt with a belleville spring washer and a lockwasher, Fig. 63.

When sharpening blades on a grinder, take care not to overheat or metal will lose its temper and become soft. Grind each blade edge equally so that blade balance will be maintained. Replace blade and attaching

parts in same order as removed. Tighten nut to 60 ft.-lbs. torque.

NOTE: Mower blades must be properly timed. The two outboard blades must be in line (parallel to each other) and center blade at 90° (perpendicular) to outboard blades.

MOWER STORAGE

When mowing season is over, remove Mower from Tractor and clean it carefully.

Remove shields from top of Mower and clean interior carefully. Remove all grass deposits from underside of housing, remove all rust and touch up bare spots with paint, available in spray cans from your Snapper Dealer.

Check condition of belt and pulleys for damage or excessive wear. Replace if necessary.

Apply a light coat of grease to mower blades and drive line. Apply oil lightly to all pivot points on mower linkage.

Place mower where it will not come in contact with excessive moisture.

Check grease in gearbox, No. 1, Fig. 66, and if necessary fill with SAE 90 EP grease to level plug, No. 2.

REMOVING MOWER FROM STORAGE

Sharpen blades if necessary.

Check bolts on cutting blades for proper tightness.

Check lubrication points and wipe off excess oil or grease.

Check all nuts on attaching parts on Tractor for proper tightness.

After Mower has been installed on Tractor, check to see if it is level.

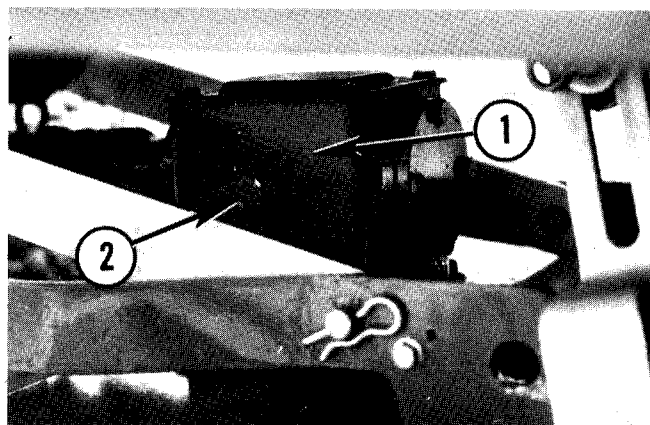


Fig. 66 — Gearbox Lubrication

- | |
|---------------|
| 1. Gearbox |
| 2. Level Plug |

MOWER SPECIFICATIONS

48" MID-MOUNT MOWER

Blades — Three	16-1/2 inches
Overlap	3/4 inch
Cutting Width	48 inches
Cutting Height (Range of Adjustment)	1-1/2" to 4"
Weight (Approx.)	175 lbs.

54" MID & REAR MOUNT

Blades — Three	18-1/2 inches
Overlap	3/4 inch
Cutting Width	54 inches
Cutting Height (Range of Adjustment)	1-1/2" to 4"
Weight (Approx.)	205 lbs.

FACTORY RECOMMENDED
NEW TRACTOR PRE-DELIVERY INSPECTION CHECK LIST

Date _____

Dealer: _____ Address _____

Tractor Model _____ Serial No. _____ Engine No. _____

**THIS PRE-DELIVERY INSPECTION CHECK LIST IS PROVIDED TO IDENTIFY THE ITEMS CHECKED
AND IF NECESSARY ADJUSTED BY THE DEALER PRIOR TO DELIVERY OF THIS MACHINE.**

INSPECT THE FOLLOWING AND ADJUST IF NECESSARY

ENGINE

- | | |
|---|---|
| <input type="checkbox"/> Engine Oil Level | <input type="checkbox"/> Activate battery |
| <input type="checkbox"/> All oil drain plugs | <input type="checkbox"/> Alternator charging |
| <input type="checkbox"/> Fuel line connections | <input type="checkbox"/> Engine RPM (idle) |
| <input type="checkbox"/> Service air filter | <input type="checkbox"/> Engine RPM (full throttle) |
| <input type="checkbox"/> Electrical connections | <input type="checkbox"/> Carburetor adjustment |
| <input type="checkbox"/> Choke control | <input type="checkbox"/> Governor performance |
| <input type="checkbox"/> Throttle control | <input type="checkbox"/> Safety Switch Operation |

CHASSIS

- | | |
|--|--|
| <input type="checkbox"/> Transaxle oil level | <input type="checkbox"/> Mower blade timing |
| <input type="checkbox"/> Lubricate fittings | <input type="checkbox"/> Torque all chassis bolts |
| <input type="checkbox"/> Clutch-brake adjustment | <input type="checkbox"/> Wheel bolts (rear) |
| <input type="checkbox"/> Steering gear | <input type="checkbox"/> Tire pressure |
| <input type="checkbox"/> Mower level | <input type="checkbox"/> Drive test |
| | <input type="checkbox"/> Is Operator's Manual with Tractor |

INSPECTION PERFORMED BY: _____

Signature _____

Explain the following to the owner

- | | |
|---|--|
| <input type="checkbox"/> Instruments and Controls | <input type="checkbox"/> Air filter service |
| <input type="checkbox"/> Wheel tread adjustment | <input type="checkbox"/> Tire and battery care |
| <input type="checkbox"/> Operating procedures | <input type="checkbox"/> Storage |
| <input type="checkbox"/> Lubrication | <input type="checkbox"/> Operator's Manual |
| | <input type="checkbox"/> Safety Instructions |

OWNER'S COPY

FACTORY RECOMMENDED

NEW TRACTOR PRE-DELIVERY INSPECTION CHECK LIST

Date _____

Customer: _____ Address _____

Tractor Model _____ Serial No. _____ Engine No. _____

THIS PRE-DELIVERY INSPECTION CHECK LIST IS PROVIDED TO IDENTIFY THE ITEMS CHECKED AND IF NECESSARY ADJUSTED BY THE DEALER PRIOR TO DELIVERY OF THIS MACHINE.

INSPECT THE FOLLOWING AND ADJUST IF NECESSARY

ENGINE

- | | |
|---|---|
| <input type="checkbox"/> Engine Oil Level | <input type="checkbox"/> Activate battery |
| <input type="checkbox"/> All oil drain plugs | <input type="checkbox"/> Alternator charging |
| <input type="checkbox"/> Fuel line connections | <input type="checkbox"/> Engine RPM (idle) |
| <input type="checkbox"/> Service air filter | <input type="checkbox"/> Engine RPM (full throttle) |
| <input type="checkbox"/> Electrical connections | <input type="checkbox"/> Carburetor adjustment |
| <input type="checkbox"/> Choke control | <input type="checkbox"/> Governor performance |
| <input type="checkbox"/> Throttle control | <input type="checkbox"/> Safety Switch Operation |

CHASSIS

- | | |
|--|--|
| <input type="checkbox"/> Transaxle oil level | <input type="checkbox"/> Mower blade timing |
| <input type="checkbox"/> Lubricate fittings | <input type="checkbox"/> Torque all chassis bolts |
| <input type="checkbox"/> Clutch-brake adjustment | <input type="checkbox"/> Wheel bolts (rear) |
| <input type="checkbox"/> Steering gear | <input type="checkbox"/> Tire pressure |
| <input type="checkbox"/> Mower level | <input type="checkbox"/> Drive test |
| | <input type="checkbox"/> Is Operator's Manual with Tractor |

INSPECTION PERFORMED BY:

Signature _____

Explain the following to the owner

- | | |
|---|--|
| <input type="checkbox"/> Instruments and Controls | <input type="checkbox"/> Air filter service |
| <input type="checkbox"/> Wheel tread adjustment | <input type="checkbox"/> Tire and battery care |
| <input type="checkbox"/> Operating procedures | <input type="checkbox"/> Storage |
| <input type="checkbox"/> Lubrication | <input type="checkbox"/> Operator's Manual |
| | <input type="checkbox"/> Safety Instructions |

DEALERS' COPY
(FILL In—Tear Out & File)

MANUFACTURER'S 1 YEAR LIMITED WARRANTY

For one year from purchase date for a non-commercial user, **or for Thirty (30) days from purchase date for a commercial user**, SNAPPER POWER EQUIPMENT, through any factory authorized service dealer, will replace for the original purchaser, free of charge, any part or parts found upon examination by the factory at McDonough, Georgia, to be defective in material or workmanship or both.

All transportation cost incurred by the purchaser in submitting material to an authorized service dealer for replacement under this warranty must be borne by the purchaser.

This warranty does not apply to engines or transmissions and their components, as these items are warranted separately by their manufacturers. Neither does it apply to parts that have been damaged by accident, alteration, abuse, improper lubrication, normal wear, or other cause beyond our control.

There is no other express warranty.

Implied warranties, including those of merchantability and fitness for a particular purpose, are limited to 1 year from purchase for non-commercial users, and for thirty (30) days from purchase for commercial users and to the extent permitted by law any and all implied warranties are excluded. This is the exclusive remedy. Liabilities for consequential damages under any and all warranties are excluded.

Some states do not allow limitations on how long an implied warranty lasts or do not allow the exclusion or limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

WARNING: Use of replacement parts other than genuine SNAPPER parts may impair the safety of your tractor.

IMPORTANT: Please fill out the attached Snapper Product Registration Card and mail to:

SNAPPER POWER EQUIPMENT, McDONOUGH, GEORGIA 30253

IT IS THE POLICY OF SNAPPER POWER EQUIPMENT TO IMPROVE ITS PRODUCTS WHENEVER IT IS POSSIBLE AND PRACTICAL TO DO SO. WE RESERVE THE RIGHT TO MAKE CHANGES OR ADD IMPROVEMENTS AT ANY TIME WITHOUT INCURRING ANY OBLIGATION TO MAKE SUCH CHANGES ON PRODUCTS MANUFACTURED PREVIOUSLY.

SNAPPER®

SNAPPER POWER EQUIPMENT

McDonough, GA • 30253

